



# **1740 SHDSL 2/4-Wire Router**

## **User's Guide**

**Document Number 1740-A2-GB20-10**

September 2004

**PARADYNE®**

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## Preface

This manual is designed to provide information to network administrators. It covers the installation, operation and applications of the 1740 SHDSL router.



### Warning

- Before servicing or disassembling this equipment, always disconnect all power and telephone lines from the wall outlet.
- Use an appropriate power supply and a UL Listed telephone line cord. Specification of the power supply is clearly stated in Appendix A - Specifications.

## FCC Part 15 Declaration

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The authority to operate this equipment is conditioned by the requirement that no modifications will be made to the equipment unless the changes or modifications are expressly approved by the responsible party.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## Notice to Users of the United States Telephone Network

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the Administrative Council for Terminal Attachment (ACTA). On the bottom side of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the Telephone Company.

This equipment is intended to connect to the Public Switched Telephone Network through a Universal Service Order Code (USOC) type RJ11C jack. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It has been designed to be connected to a compatible modular jack that is also compliant.

The Ringer Equivalence Number (or REN) is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local Telephone Company. The REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point. For example, 03 represents a REN of 0.3.

If the modem causes harm to the telephone network, the Telephone Company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the Telephone Company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The Telephone Company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the Telephone Company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service. If trouble is experienced with the modem, refer to the repair and warranty information in this document.

If the equipment is causing harm to the telephone network, the Telephone Company may request that you disconnect the equipment until the problem is resolved.

The user may make no repairs to the equipment.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

If the site has specially wired alarm equipment connected to the telephone line, ensure the installation of the modem does not disable the alarm equipment. If you have questions about what will disable alarm equipment, consult your Telephone Company or a qualified installer.

### **Notice to Users of the Canadian Telephone Network**

NOTICE: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation IC before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

NOTICE: The Ringer Equivalence Number (REN) for this terminal equipment is labeled on the equipment. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

If your equipment is in need of repair, contact your local sales representative, service representative, or distributor directly.

### **Canada – EMI Notice:**

This Class B digital apparatus meets all requirements of the Canadian interference-causing equipment regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du règlement sur le matériel brouilleur du Canada.

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## CHAPTER 1 Overview

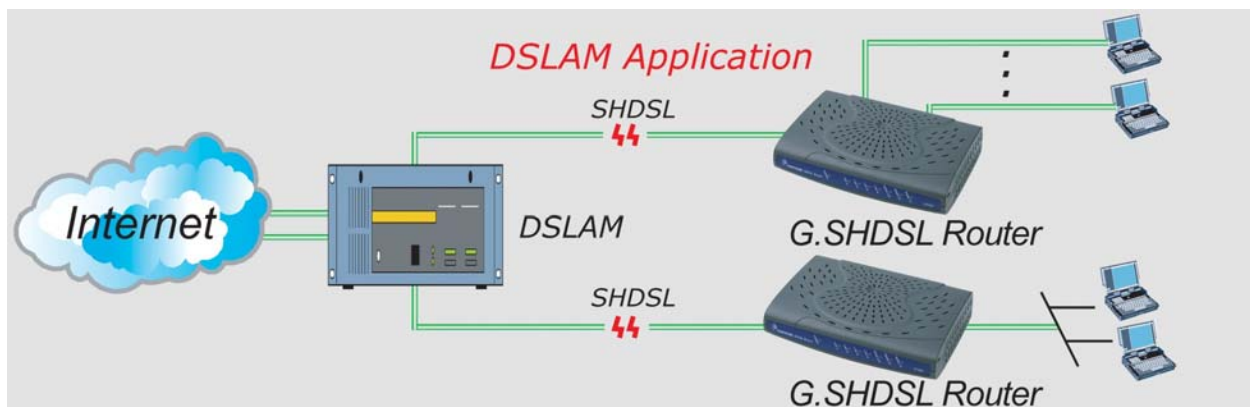
The 1740 SHDSL router satisfies the needs of multiple users in small/home offices and remote/branch offices. It provides symmetrical transmission speeds of up to 4.6 Mbps through a SHDSL connection, over a two-wire or four-wire line. In addition, it supports up to 16 virtual concurrent connections to multiple destinations. The integrated four-port switch enables up to four devices to be connected to the LAN.

The SHDSL router can be used for variety of applications, including video conferencing, remote training, e-commerce, and other multimedia applications. Easy configuration and monitoring can be accomplished using the Web browser.

The SHDSL router has full routing capabilities to segment/route IP protocol and is capable of bridging other protocols. It can be also configured in either server or client mode enabling point-to-point connectivity between two sites.

### 1.1 Application

The router can be used for DSLAM and point-to-point applications.



#### DSLAM Application

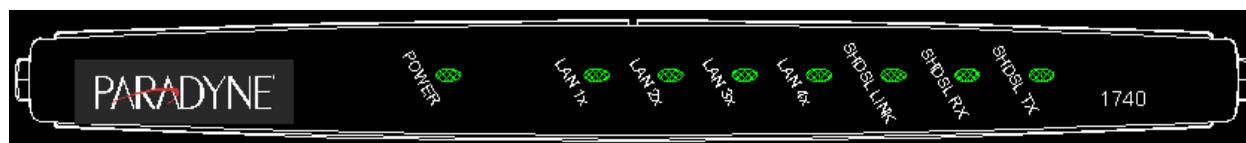


#### Point-to-Point Application



## 1.2 LED Indicators

There are eight LEDs on the front panel of the router; the functions of the LEDs are described in the table below.



**Figure 1-1 Faceplate LED Indicators**

LED	Color	Mode	Function
POWER	Green	On	Power is supplied
		Off	Power is not supplied
LAN 1X–4X	Green	Off	No data transmitted or received over the Ethernet link
		On	The Ethernet link is established
		Flash	Transmitting or receiving data over Ethernet link
SHDSL LINK	Green	On	The physical link through the RJ45 connection cable is established
		Flash	The SHDSL line is training
		Off	A SHDSL connection is not established
SHDSL RX	Green	On	Receiving data over the SHDSL link
		Off	No data receiving over the SHDSL link
SHDSL TX	Green	On	Transmitting data over the SHDSL link
		Off	No data transmitting over the SHDSL link

## CHAPTER 2 Installation

### 2.1 Preparing for Hardware Installation

The following equipment may be necessary to install the router:

- **AC power adapter**

A power adapter is shipped with the router.

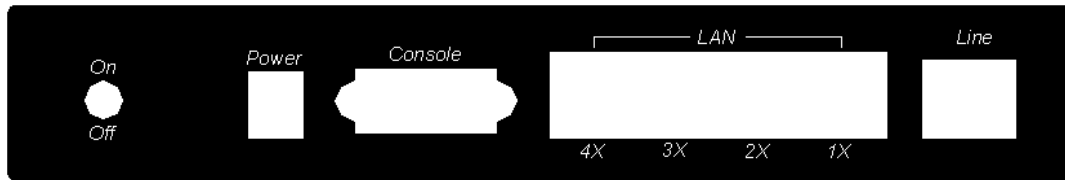
- **LAN connection cable**

To connect to the hub, use a straight-through RJ45 cable. To connect to a PC, use a crossover RJ45 cable.

- **Four-wire (8P8C) straight-through RJ45 cable**

A four-wire (8P8C) straight through RJ45 cable is needed to connect to the LINE port to the wall outlet.

## 2.2 Rear-panel Connections



### DSL connection

Connect the supplied RJ45 cable to the port marked LINE at the back of the SHDSL router. Connect the other end of the cable to your telephone-line wall outlet. Ensure your computer is turned on before you connect the DSL line to the router. A green LED on the front of the device labeled LINK will illuminate steadily. If the SHDSL LINK LED does not illuminate steadily within one minute of it being connected, check your cable connections to ensure they are correct and securely installed.

### Ethernet connection

Insert one end of the RJ45 Ethernet cable into one of the LAN ports marked LAN on the back of the SHDSL router. Connect the other end of the cable into your Ethernet Network Interface Card (NIC) installed in your computer. When the Ethernet connection is established, the correspondent green LED on the front panel labeled LAN will illuminate steadily. You can connect up to four PCs to the router.

### Power connection

Connect the supplied external AC adapter into the DC power outlet on the back of the router. Connect the power supply into your wall outlet or surge protector. Turn on the power switch. After powering on, the router performs a self-test. Wait for a few seconds until the test is finished, then the router will be ready to operate. The POWER indicator on the front of the router will illuminate green to indicate that power is being supplied to the router.

---

**Caution 1:** If the router fails to power up, or it malfunctions, first verify that the power supply is connected correctly. Then power it on again. If the problem persists, contact your technical support representative.

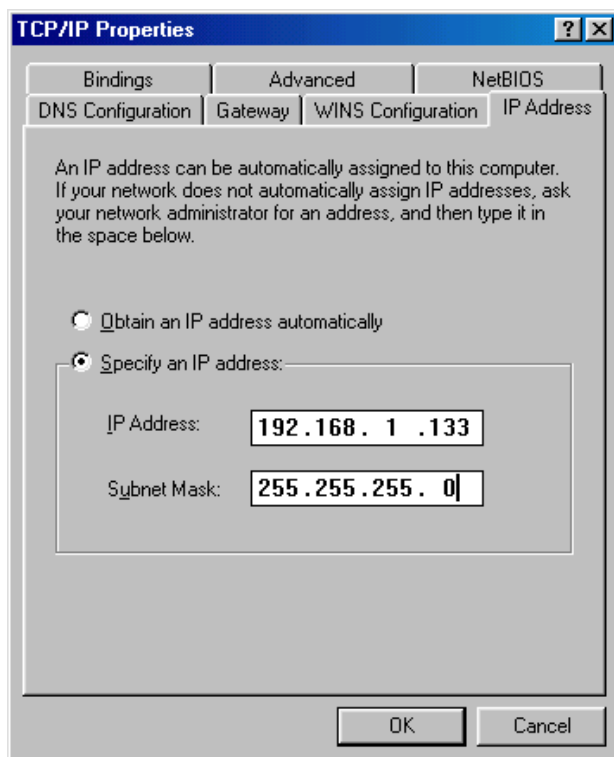
**Caution 2:** Before servicing or disassembling this equipment always disconnect all power cords and telephone lines from the wall outlet.

## CHAPTER 3 Quick Installation

This section describes how to manage the router via the Web browser from the remote end. The Web page is best read with a display resolution of 1024 x 768. To change the resolution, go to the Microsoft Windows Control Panel and click on the **Display** icon. You will find the display settings there.

### 3.1 Login

**STEP 1:** Configure your workstation to the same network segment as the router, if for example the router is set to its default address of 192.168.1.1, we could set the PC to 192.168.1.133 and subnet mask 255.255.255.0.



**STEP 2:** Start your Internet browser.

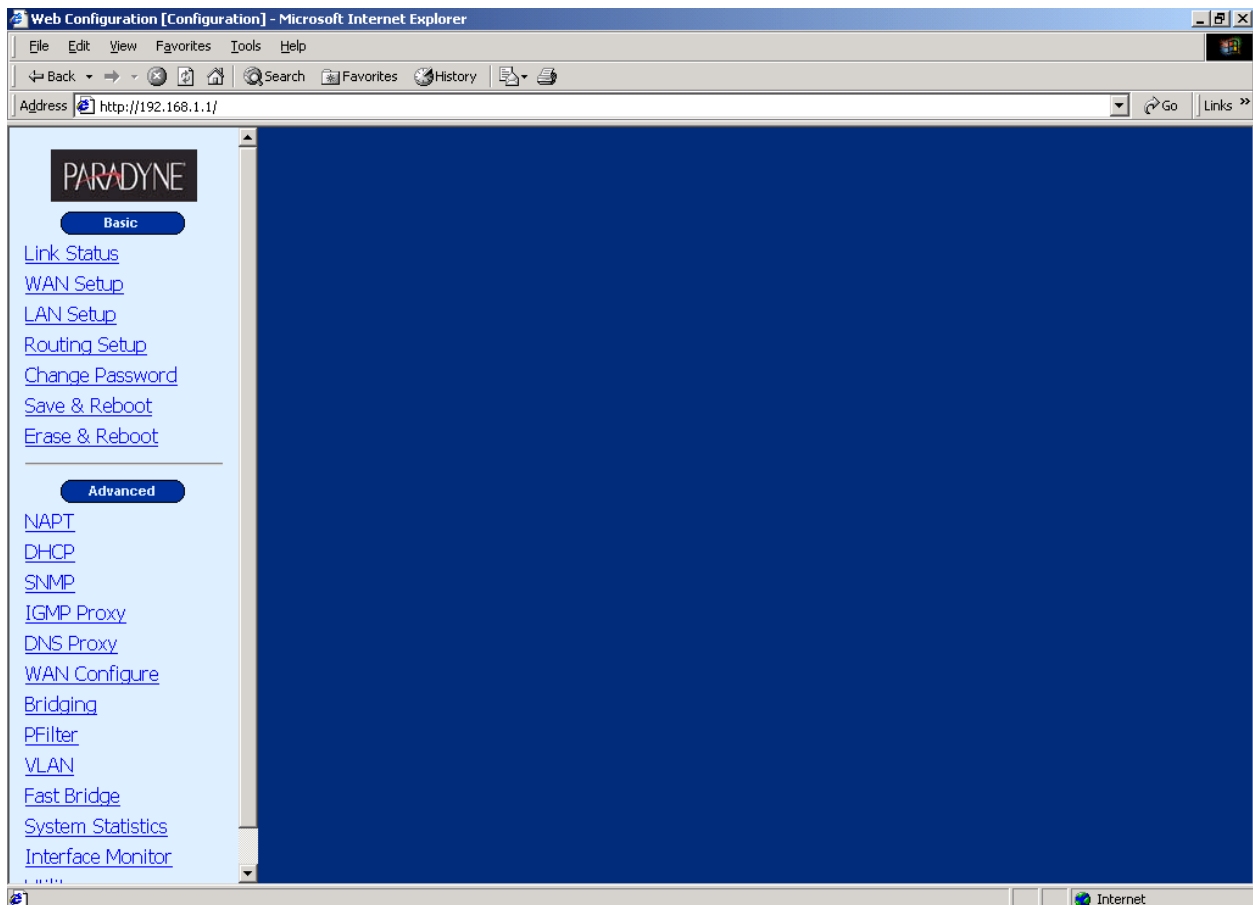
**STEP 3:** Enter the IP address of the router in the Web address field. For example, if the IP address is 192.168.1.1, enter http:// 192.168.1.1

**STEP 4:** You will be prompted to enter your user name and password. Type your password, or if the password was not changed, type the default passwords. The default ADMINISTRATOR user name and password are **root**.



The image shows a Windows-style dialog box titled "Enter Network Password". It contains a key icon and the text "Please type your user name and password." Below this, there are fields for "Site:" (192.168.1.1), "Realm:" (SHDSL router login), "User Name:" (root), and "Password:" (xxxxx). There is a checkbox labeled "Save this password in your password list" which is unchecked. At the bottom are "OK" and "Cancel" buttons.

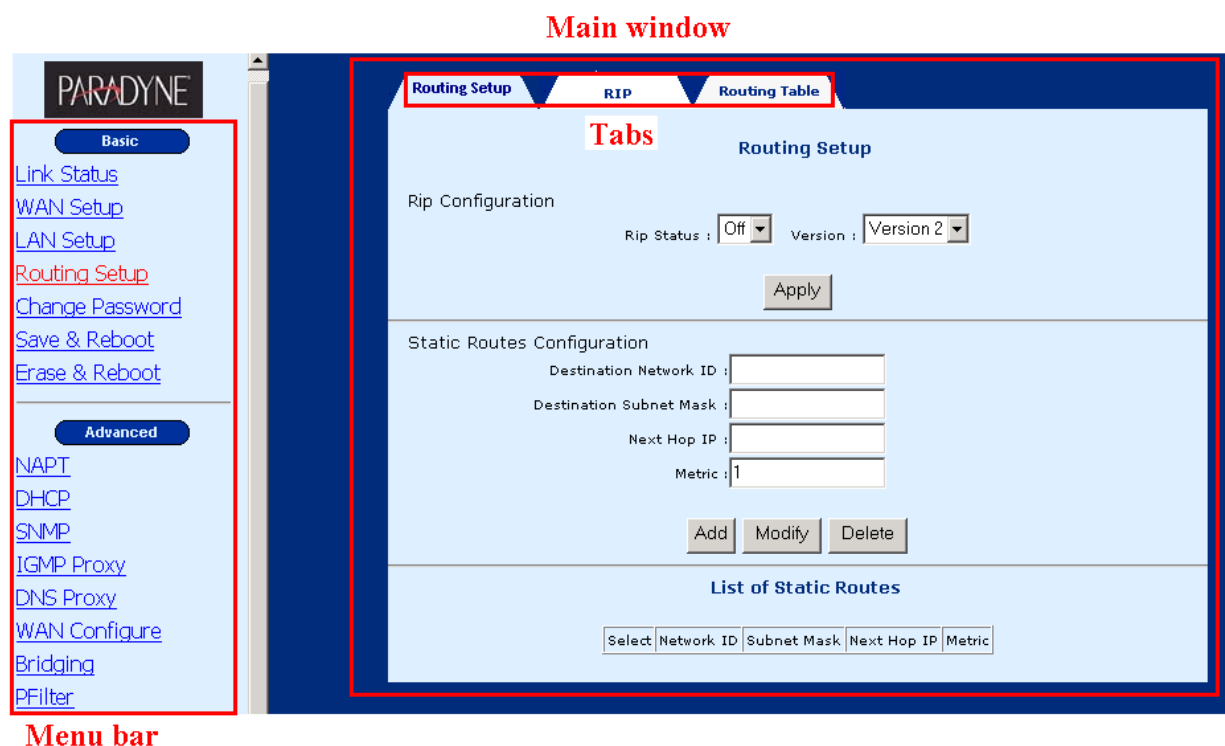
**STEP 5:** After successfully logging in, you will reach the main configuration page. The left hand side has a menu and the right side is blank.



## 3.2 Web Page Layout

On each Web page, there are two areas:

- **Menu Bar:** On the left side of the Web page is the menu bar. It is divided into two parts: Basic and Advanced. The **Basic** menu bar sets up the device for quick setup. The **Advanced** menu bar configures advance functions such as SNMP, DHCP server, and DNS proxy. The menu also covers the maintenance function.
- **Main Window:** The main window in middle of the page displays after clicking a button on the menu bar. It includes the tabs on the top of the window. The tabs lead to other sub-screens.



### 3.3 Monitoring the SHDSL Line

Click **Link Status** on the Basic menu bar. The Link Status screen has two tabs: SHDSL Status and Performance. **SHDSL Status** is used to monitor the SHDSL link and the **Performance** is used to monitor the SHDSL performance.

Terminal Type	CPE	CPE
Operate State	Handshake	Handshake
Actual Bit Rate (Kbps)	0	0
Line Attenuation (dB)	0	0
SNR Margin (dB)	37	37
ESs (current 15 min)	0	0
ESs (current 1 day)	0	0
CRCs (since reset)	0	0

The following is the screen after clicking the **[Performance]** button.

The screenshot shows a Microsoft Internet Explorer browser window displaying the Paradyne Web Configuration interface. The address bar shows <http://192.168.1.1/>. The interface has a left sidebar with navigation links under 'Basic' and 'Advanced' sections. The main content area is titled 'SHDSL Status' and 'Performance'. It contains a table with performance metrics and a 'Reset' button.

Metric	Value 1	Value 2
Line Attenuation (dB)	0	0
SNR Margin (dB)	37	37
CRCs (since reset)	0	0
ESs (since reset)	0	0
SESs (since reset)	0	0
LOSWs (since reset)	3711	3711
UASs (since reset)	3711	3711
CRCs (current 15 min)	0	0
ESs (current 15 min)	0	0
SESs (current 15 min)	0	0
LOSWs (current 15 min)	112	112
UASs (current 15 min)	112	112
CRCs (current 1 day)	0	0
ESs (current 1 day)	0	0
SESs (current 1 day)	0	0
LOSWs (current 1 day)	3711	3711
UASs (current 1 day)	3711	3711

Reset



### 3.4 WAN Interface Configuration

The router supports 16 ATM interfaces. A virtual channel (VC) can be configured for each ATM interface such as ATM1 to VC1, ATM 2 to VC2, and so on. Each VC can be specified with a protocol, which can be RFC 1483 bridged, RFC 1483 Routed, PPPoE, or PPPoA.

By default, VC1 is enabled with the parameters VPI/VCI 0/35 and protocol RFC 1483 Bridged. VC1 can work without any modifications. VCs 2 to 16 are disabled.

If the VC is added on the Basic> Wan Setup, it will be added from VC2 to VC16. (VC1 is already enabled for 0/35).

If a PPPoE-based VC is created on Basic>WAN Setup, the DHCP server will be automatically enabled. If a PPPoE based VC is created on Advanced>Interface, the DHCP server function must be enabled manually.

The WAN interface can be configured to operate in the following modes: bridge, router, PPPoE, or PPPoA. Configuration for each mode is explained in the sections that follow.

#### 3.4.1 Bridge Mode: Service for One Fixed IP Address

To configure one static IP address, you need to set up the VC in RFC 1483 Bridged mode. The router has a default Virtual Channel (VC) of 0/35. It can function without other modifications.

**Web Configuration [Configuration] - Microsoft Internet Explorer**

Address: <http://192.168.1.1/>

**PARADYNE**

**Basic**

[Link Status](#)  
[WAN Setup](#)  
[LAN Setup](#)  
[Routing Setup](#)  
[Change Password](#)  
[Save & Reboot](#)  
[Erase & Reboot](#)

**Advanced**

[NAPT](#)  
[DHCP](#)  
[SNMP](#)  
[IGMP Proxy](#)  
[DNS Proxy](#)  
[WAN Configure](#)  
[Bridging](#)  
[PFilter](#)  
[VLAN](#)  
[Fast Bridge](#)  
[System Statistics](#)  
[Interface Monitor](#)  
[Utilities](#)

**WAN Setup**

VPI : 0 VCI : 34 ☒ LLC/SNAP ☐ Vc Multiplexing ☐ Enable NAPT

☒ **RFC1483 Bridged**

☐ RFC1483 Routed

WAN IP address:  WAN subnet mask:

☐ PPPoE (NAT Enabled)

User name:  Password:

Mode: direct Idle Timeout(min):  ☐ Enable DHCP Server

Keepalive Interval(sec):

☐ PPPoA (NAT Enabled)

User name:  Password:

Keepalive Interval(sec):

**Current ATM PVC List**

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	Keepalive Interval	PPPoE Mode	Status
<input type="radio"/>	Bridged	0	35	LLC	OFF	-	-	-	-	0	0	-	Down
<input checked="" type="radio"/>	Bridged	0	34	LLC	OFF	-	-	-	-	0	0	-	Down

Done Internet

**STEP 1:** Click **WAN Setup** on the Basic menu bar, and enter values for: VPI, VCI, Encapsulation (LLC or VC MUX).

VPI	Enter a value for the virtual path identifier
VCI	Enter a value for the virtual channel identifier
LLCEncapsulation:	With LLC encapsulation, a link control header is added to the Ethernet packet that identifies the protocol type (Ethernet). This allows multiple protocols to be transmitted over the ATM Virtual Circuit.
VC Multiplexing:	With VC Multiplexing, no link control header is needed as the ATM Virtual Circuit is assumed to be carrying a single protocol.
Enable NAPT	This function cannot be set for bridge mode.

**STEP 2:** Click on RFC 1483 Bridged.

**STEP 3:** Click on the **Add** button. The new VC is added in the Current ATM PVC List on the bottom screen.

To modify the VC, click a VC from the Current ATM PVC List to display the parameters of the VC. Change its parameters and click on the **Modify** button.

### 3.4.2 Router Mode: Service for Five Static IP Addresses

To set up the service for five static IP addresses, you need to set up the VC in RFC 1483 Routed mode.

**STEP 1:** Click **WAN Setup** on the Basic menu bar.

**STEP 2:** Enter values for: VPI, VCI, Encapsulation (LLC or VC MUX), Enable NAPT.

VPI	Enter a value for the virtual path identifier
VCI	Enter a value for the virtual channel identifier
LLCEncapsulation:	With LLC encapsulation, a link control header is added to the Ethernet packet that identifies the protocol type (Ethernet). This allows multiple protocols to be transmitted over the ATM Virtual Circuit.
VC Multiplexing:	With VC Multiplexing, no link control header is needed as the ATM Virtual Circuit is assumed to be carrying a single protocol.
Enable NAPT	Selecting <b>Enabling NAPT</b> will enable Network Port Address Translation on the WAN interface.

**STEP 3:** Click on the **RFC 1483 Routed** option.

**Web Configuration [Configuration] - Microsoft Internet Explorer**

Address: <http://192.168.1.1/>

**PARADYNE**

**Basic**

[Link Status](#)  
[WAN Setup](#)  
[LAN Setup](#)  
[Routing Setup](#)  
[Change Password](#)  
[Save & Reboot](#)  
[Erase & Reboot](#)

**Advanced**

[NAPT](#)  
[DHCP](#)  
[SNMP](#)  
[IGMP Proxy](#)  
[DNS Proxy](#)  
[WAN Configure](#)  
[Bridging](#)  
[PFilter](#)  
[VLAN](#)  
[Fast Bridge](#)  
[System Statistics](#)  
[Interface Monitor](#)  
[Utilities](#)

**WAN Setup**

**WAN Setup**

VPI:  VCI:  ☒ LLC/SNAP ☐ Vc Multiplexing ☒ Enable NAPT

☐ RFC1483 Bridged

☒ **RFC1483 Routed**

WAN IP address:  WAN subnet mask:

☐ PPPoE (NAT Enabled)

User name:  Password:   
Mode:  Idle Timeout(min):  ☐ Enable DHCP Server  
Keepalive Interval(sec):

☐ PPPoA (NAT Enabled)

User name:  Password:   
Keepalive Interval(sec):

**Current ATM PVC List**

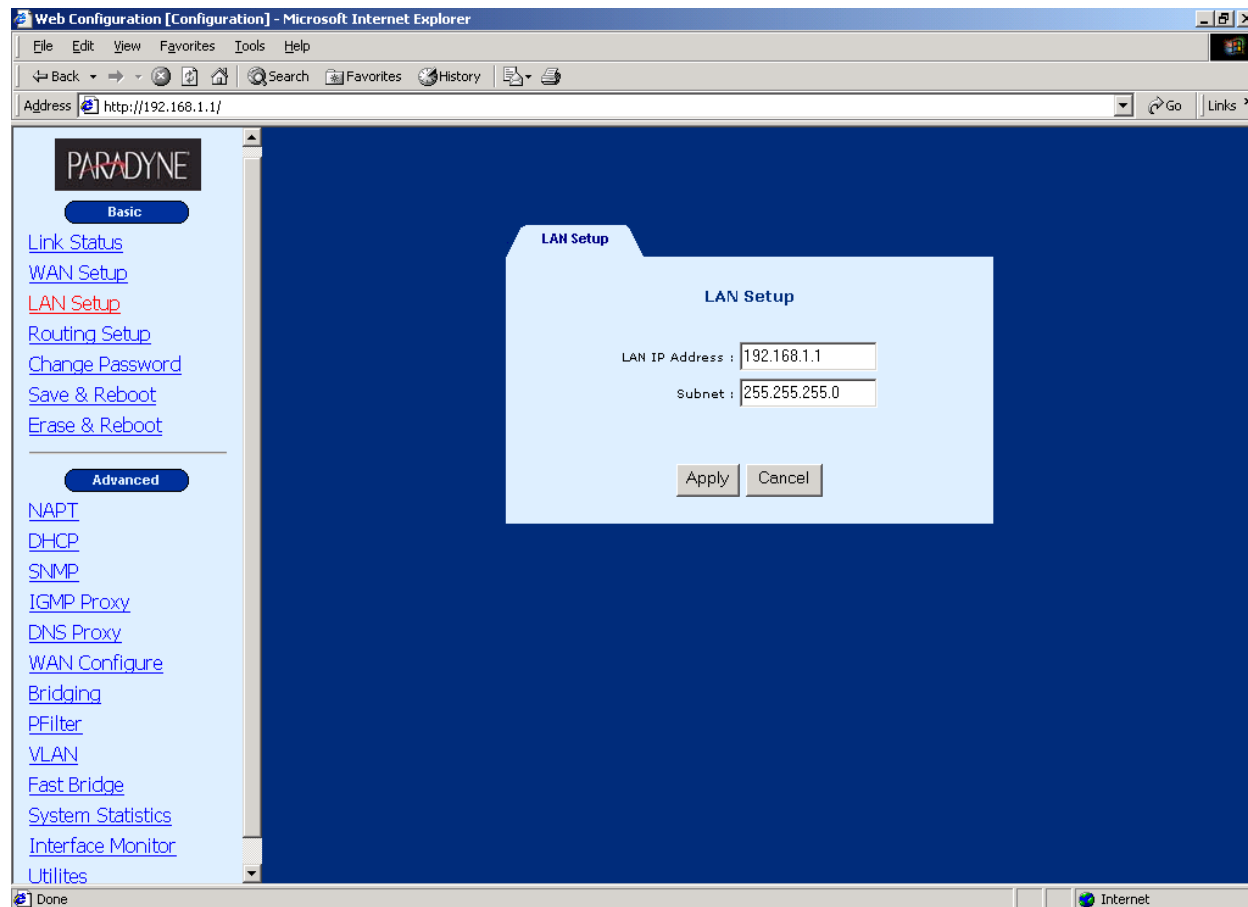
Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	Keepalive Interval	PPPoE Mode	Status
<input type="radio"/>	Bridged	0	35	LLC	OFF	-	-	-	-	0	0	-	Down
<input checked="" type="radio"/>	Routed	0	34	LLC	ON	10.0.0.1	255.255.255.252	-	-	0	0	-	Down

Done Internet

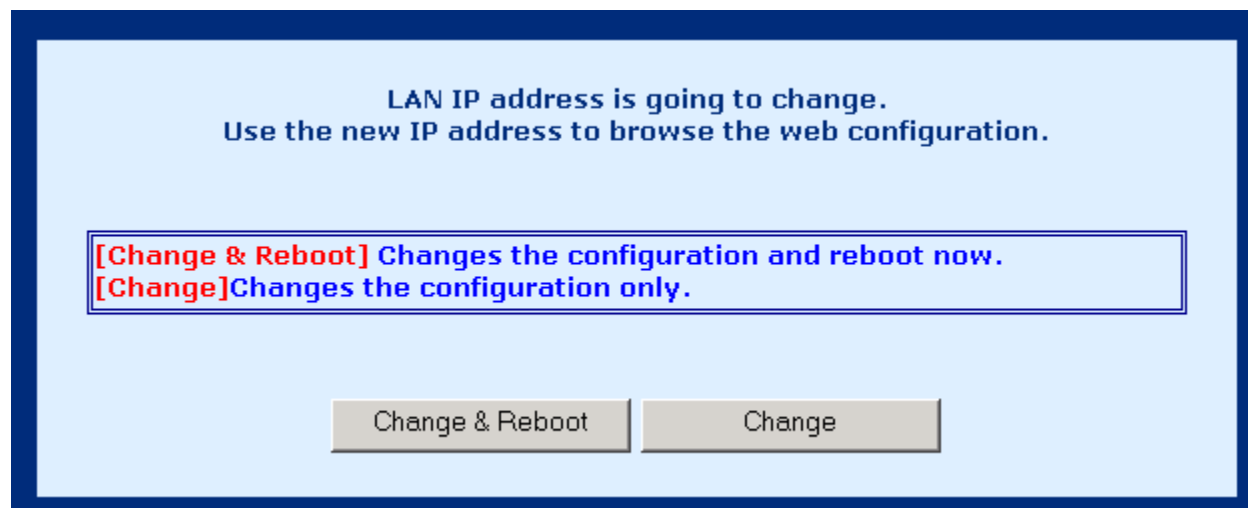
**STEP 4:** Click on the **Add** button. The new VC is added in the Current ATM PVC List on the bottom screen.

To modify the VC, click a VC from the Current ATM PVC List to display the parameters of the VC. Change its parameters and click on the **Modify** button.

After creating an RFC 1483 Routed VC, click **LAN Setup** to set up the router's Ethernet IP address.



- After changing the IP address, click **Apply** to display the following screen. The Change & Reboot button allows you to use the new IP address and reboot the router immediately. The Change button allows using the IP address immediately but you need to save the setting by clicking **Save & Reboot** on the Basic menu bar. To use the Web Browser, make sure you change the PC's IP address.



For example, to change the default VC 0/35 from Mode RFC 1483 Bridged to Mode RFC 1483 Routed, follow the steps below.

**STEP1:** Click **WAN Setup** on the Basic menu bar.

**STEP2:** Select 0/35 from the Current ATM PVC List to display the parameters and click **RFC 1483 Routed** and then click on the **Modify** button.

**Web Configuration [Configuration] - Microsoft Internet Explorer**

檔案(F) 編輯(E) 檢視(V) 我的最愛(A) 工具(T) 說明(H)

地址 http://192.168.1.1/

**PARADYNE**

**Basic**

[Link Status](#)  
[WAN Setup](#)  
[LAN Setup](#)  
[Routing Setup](#)  
[Change Password](#)  
[Save & Reboot](#)  
[Erase & Reboot](#)

**Advanced**

[NAPT](#)  
[DHCP](#)  
[SNMP](#)  
[IGMP Proxy](#)  
[DNS Proxy](#)  
[WAN Configure](#)  
[Bridging](#)  
[PFilter](#)  
[VLAN](#)  
[Fast Bridge](#)  
[System Statistics](#)  
[Interface Monitor](#)  
[Utilities](#)

**WAN Setup**

VPI : 0 VCI : 35 ☒ LLC/SNAP ☐ Vc Multiplexing ☐ Enable NAPT

☐ RFC1483 Bridged

☒ RFC1483 Routed

WAN IP address: 10.0.0.1 WAN subnet mask: 255.255.255.252

☐ PPPoE (NAT Enabled)

User name: Password: Mode: direct Idle Timeout(min): 0 ☐ Enable DHCP Server

Keepalive Interval(sec): 0

☐ PPPoA (NAT Enabled)

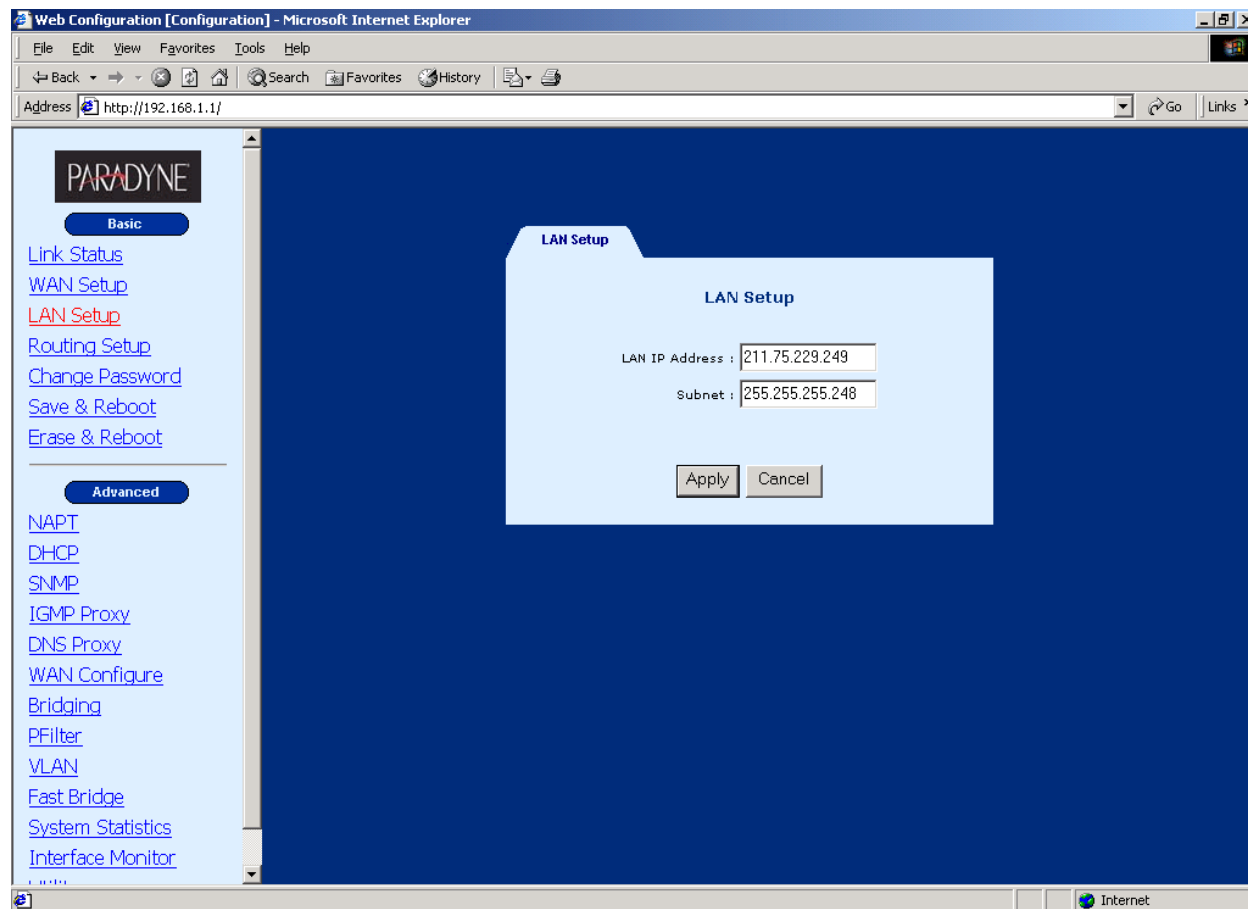
User name: Password: Keepalive Interval(sec): 0

**Current ATM PVC List**

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	Keepalive Interval	PPPoE Mode	Status
<input checked="" type="checkbox"/>	Routed	0	35	LLC	OFF	10.0.0.1	255.255.255.252	-	-	0	0	-	Down

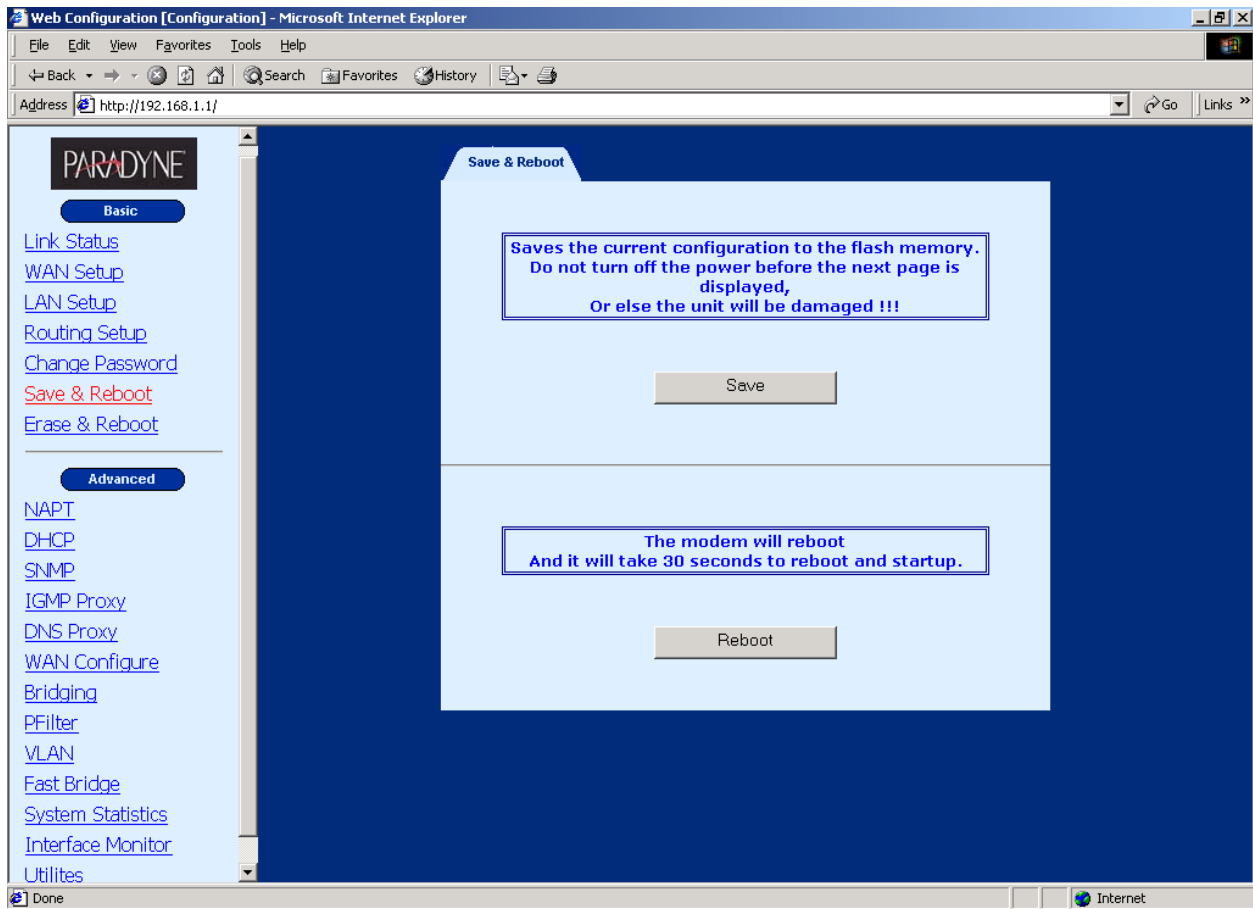
完成 網際網路

**STEP 3:** Click **LAN Setup** on the menu bar to type the IP address for the LAN port. Click **LAN Setup** on the menu bar and type the IP address and Subnet (should be 255.255.255.248 for static five IP address service) and then click **Apply**.



**Note:** After the IP address is changed, your PC and the **router** are on different network segments. Therefore, you cannot use the web browser to configure the **router**. You must change your PC's IP address.

**STEP 4:** Click **Save & Reboot** on the Basic menu bar to save your settings.



### 3.4.3 PPPoE

When a VC is configured for PPPoE, the router will auto-detect the Authentication code (PAP or CHAP). The NAPT and DHCP server functions will be enabled automatically.

**STEP 1:** Click **WAN Setup** on the Basic menu bar and enter the following parameters to set up PPPoE.

VPI	Enter a value for the virtual path identifier
VCI	Enter a value for the virtual channel identifier
LLC Encapsulation:	With LLC encapsulation, a link control header is added to the Ethernet packet that identifies the protocol type (Ethernet). This allows multiple protocols to be transmitted over the ATM Virtual Circuit.
VC Multiplexing:	With VC Multiplexing, no link control header is needed as the ATM Virtual Circuit is assumed to be carrying a single protocol.
Enable NAPT	Selecting <b>Enabling NAPT</b> will enable Network Port Address Translation on the WAN interface.
User Name/Password	These two fields are used for remote subscriber to log on for Internet access.
Mode	Direct and Auto. If the mode is set to Auto, the PPPoE negotiation automatically starts when the system identifies any traffic required to be transferred on the link. When DIRECT is selected the PPPoE negotiation is started manually.
Idle Timeout	The Idle Time field defines the period of idle time after which the PPPoE link will be terminated. It is functional in the auto mode. The default setting is 5 minutes. In Direct mode, this function is not used and the field displays zero.
Enable DHCP server	Check the item to enable the DHCP server or uncheck it to disable it.
Keepalive Interval(sec):	Keep-alive is a networking operation that periodically (default-every 10 seconds) checks the availability of a PPPoE/PPPoA connection between the CO and CPE. If the keep-alive message is not acknowledged, the connection will be interrupted.



**Web Configuration [Configuration] - Microsoft Internet Explorer**

Address: <http://192.168.1.1/>

**PARADYNE**

**Basic**

[Link Status](#)  
[WAN Setup](#)  
[LAN Setup](#)  
[Routing Setup](#)  
[Change Password](#)  
[Save & Reboot](#)  
[Erase & Reboot](#)

**Advanced**

[NAPT](#)  
[DHCP](#)  
[SNMP](#)  
[IGMP Proxy](#)  
[DNS Proxy](#)  
[WAN Configure](#)  
[Bridging](#)  
[PFilter](#)  
[VLAN](#)  
[Fast Bridge](#)  
[System Statistics](#)  
[Interface Monitor](#)  
[Utilities](#)

**WAN Setup**

VPI : 0 VCI : 34 LLC/SNAP Vc Multiplexing ☒ Enable NAPT

☐ RFC1483 Bridged

☐ RFC1483 Routed

WAN IP address: WAN subnet mask:

☒ PPPoE (NAT Enabled)

User name: ifddre Password:

Mode: direct Idle Timeout(min): 0 ☒ Enable DHCP Server

Keepalive Interval(sec): 10

☐ PPPoA (NAT Enabled)

User name: Password:

Keepalive Interval(sec): 0

**Current ATM PVC List**

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	Keepalive Interval	PPPoE Mode	Status
<input type="radio"/>	Bridged	0	35	LLC	OFF	-	-	-	-	0	0	-	Down
<input checked="" type="radio"/>	PPPoE	0	34	LLC	ON	-	-	ifddre	-	0	10	direct	Down

**STEP 3:** Click **PPPoE**, and type the user name and password that the remote subscriber needs for Internet access.

**STEP 4:** Click on the **Add** button. The new VC is added in the Current ATM PVC List on the bottom screen.

To modify the VC, click a VC from the Current ATM PVC List to display the parameters of the VC. Change its parameters and click on the **Modify** button.

### 3.4.4 PPPoA

When a VC is configured for PPPoA, the router will auto-detect the Authentication code (PAP or CHAP), and the NAPT function will be enabled automatically.

**STEP 1:** Click **WAN Setup** on the Basic menu bar.

**STEP 2:** Enter values for the following fields: VPI, VCI, Encapsulation (LLC or VC MUX), Enable NAPT.

The screenshot shows the 'WAN Setup' configuration page in a web browser. The browser's address bar shows 'http://192.168.1.1/'. The page has a sidebar with a 'Basic' menu and a list of links including 'Link Status', 'WAN Setup', 'LAN Setup', 'Routing Setup', 'Change Password', 'Save & Reboot', 'Erase & Reboot', 'Advanced', 'NAPT', 'DHCP', 'SNMP', 'IGMP Proxy', 'DNS Proxy', 'WAN Configure', 'Bridging', 'PFilter', 'VLAN', 'Fast Bridge', 'System Statistics', 'Interface Monitor', and 'Utilities'. The main content area is titled 'WAN Setup' and contains several sections. A red box highlights the top section where 'VPI' is set to 0, 'VCI' is empty, 'LLC/SNAP' is selected, 'Vc Multiplexing' is unselected, and 'Enable NAPT' is checked. Below this, there are radio buttons for 'RFC1483 Bridged', 'RFC1483 Routed', 'PPPoE (NAT Enabled)', and 'PPPoA (NAT Enabled)'. The 'PPPoA (NAT Enabled)' section is highlighted with a red box and contains fields for 'User name', 'Password', and 'Keepalive Interval(sec)' set to 10. Below this are 'Add', 'Modify', and 'Delete' buttons. At the bottom, there is a table titled 'Current ATM PVC List' with columns: Select, Mode, VPI, VCI, Encap, NAPT, IP Address, Subnet Mask, User Name, Authentication Protocol, Idle Timeout, Keepalive Interval, PPPoE Mode, and Status. The table has two rows: one for 'Bridged' mode and one for 'PPPoA' mode. The 'PPPoA' row is highlighted with a red box.

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	Keepalive Interval	PPPoE Mode	Status
<input type="radio"/>	Bridged	0	35	LLC	OFF	-	-	-	-	0	0	-	Down
<input checked="" type="radio"/>	PPPoA	0	34	LLC	ON	-	-	werwe	-	0	10	-	Down

VPI	Enter a value for the virtual path identifier
VCI	Enter a value for the virtual channel identifier
LLC Encapsulation:	With LLC encapsulation, a link control header is added to the Ethernet packet that identifies the protocol type (Ethernet). This allows multiple protocols to be transmitted over the ATM Virtual Circuit.
VC Multiplexing:	With VC Multiplexing, no link control header is needed as the ATM Virtual Circuit is assumed to be carrying a single protocol.
Enable NAPT	Selecting <b>Enabling NAPT</b> will enable Network Port Address Translation on the WAN interface.

Keepalive Interval(sec):	Keep-alive is a networking operation that periodically checks the availability of a PPPoE/PPPoA connection between the CO and CPE. If the keep-alive message is not acknowledged, the connection will be interrupted.
--------------------------	---

**STEP 3:** Click **PPPoA**, and type the user name and password that the remote subscriber needs for Internet access.

**STEP 4:** Click on the **Add** button. The new VC is added in the Current ATM PVC List on the bottom screen.

To modify the VC, click a VC from the Current ATM PVC List to display the parameters of the VC. Change its parameters and click on the **Modify** button.

### 3.5 Password Setup

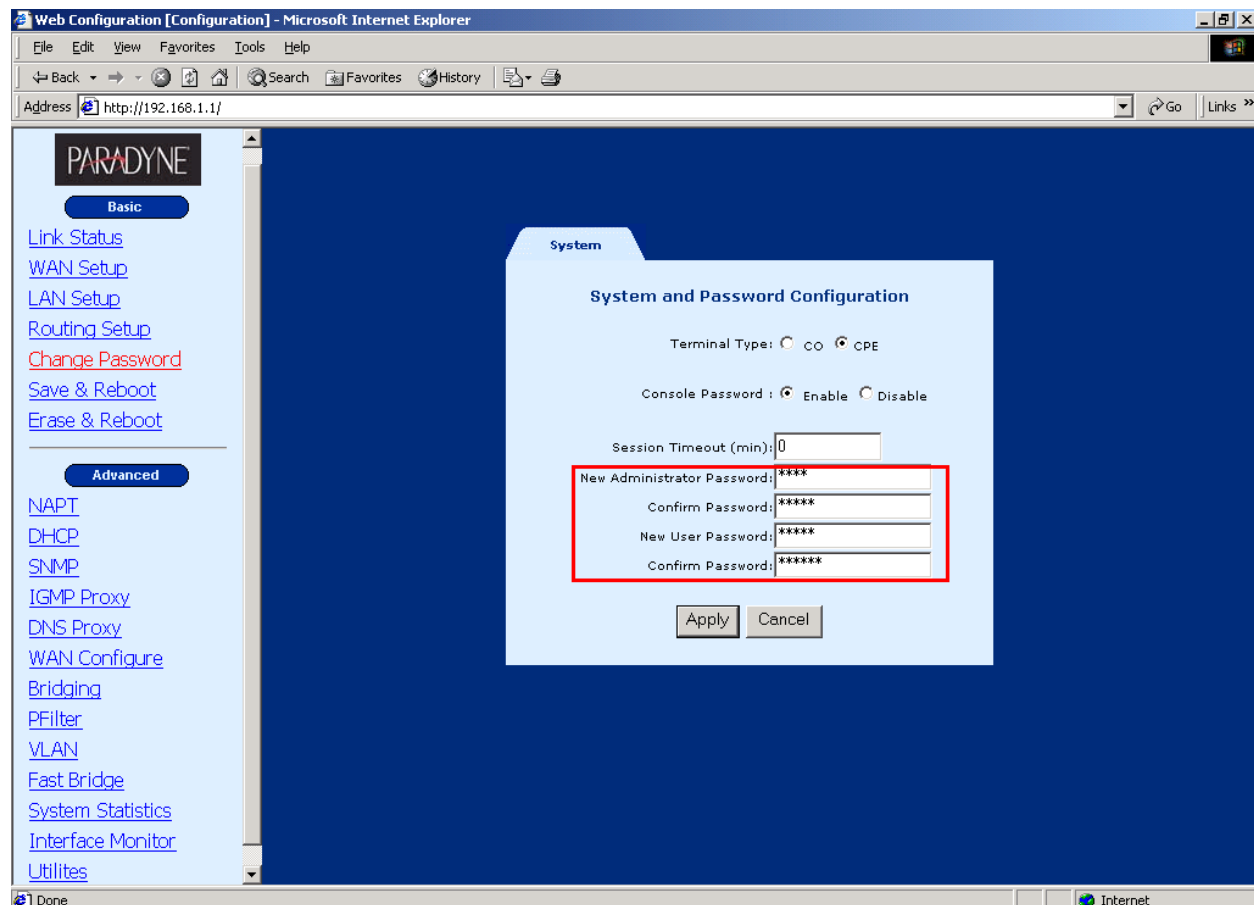
There are two types of access privileges. A system ADMINISTRATOR is the only person that can configure, change parameters, monitor, and read the performance and status of the system. A USER can only monitor and read the status of the system. The password for access through the Web is the same as for Telnet access.

To set up a password, complete the following steps:

**STEP 1** Click **Change Password** on the Basic menu bar.

**STEP 2** Enter the passwords for Administrator and User, and confirm the new password by re-typing the password again.

**STEP 3** Click **Apply** to complete the settings and save the setting by entering the **Save & Reboot** screen on the basic menu bar.



- **Terminal Type:** When the router is connected to the DSLAM, select CPE. When the router is connect to a router for point to point application, one of the devices should be set to CO with the other set to CPE. The default setting is CPE.
- **Console Password:** **Disabled**, a local user does not have to enter a password to enter the console mode. **Enabled**, users who attempt to access the device from the console will be prompted for the password.

- **Session Timeout:** The console or telnet session will be terminated after this idle time. It is calculated in minutes. Users need to re-log on to the device when the session times out. The default setting is zero, which means the function is disabled.

## 3.6 Setting the Bridge

Click on **Bridging** on the Advanced menu bar to set up the static bridging and Spanning Tree Protocol (STP) functions.

### 3.6.1 Spanning Tree Protocol

The STP function is disabled by factory default. To enable it, click **Enable** in the Spanning Tree field and configure the interfaces on the screen. When the parameters are set up, click **Apply** to submit the settings.

**Web Configuration [Configuration] - Microsoft Internet Explorer**

Address: http://192.168.1.1/

**PARADYNE**

**Basic**

[Link Status](#)  
[WAN Setup](#)  
[LAN Setup](#)  
[Routing Setup](#)  
[Change Password](#)  
[Save & Reboot](#)  
[Erase & Reboot](#)

**Advanced**

[NAPT](#)  
[DHCP](#)  
[SNMP](#)  
[IGMP Proxy](#)  
[DNS Proxy](#)  
[WAN Configure](#)  
[Bridging](#)  
[PFilter](#)  
[VLAN](#)  
[Fast Bridge](#)  
[System Statistics](#)  
[Interface Monitor](#)  
[Utilities](#)

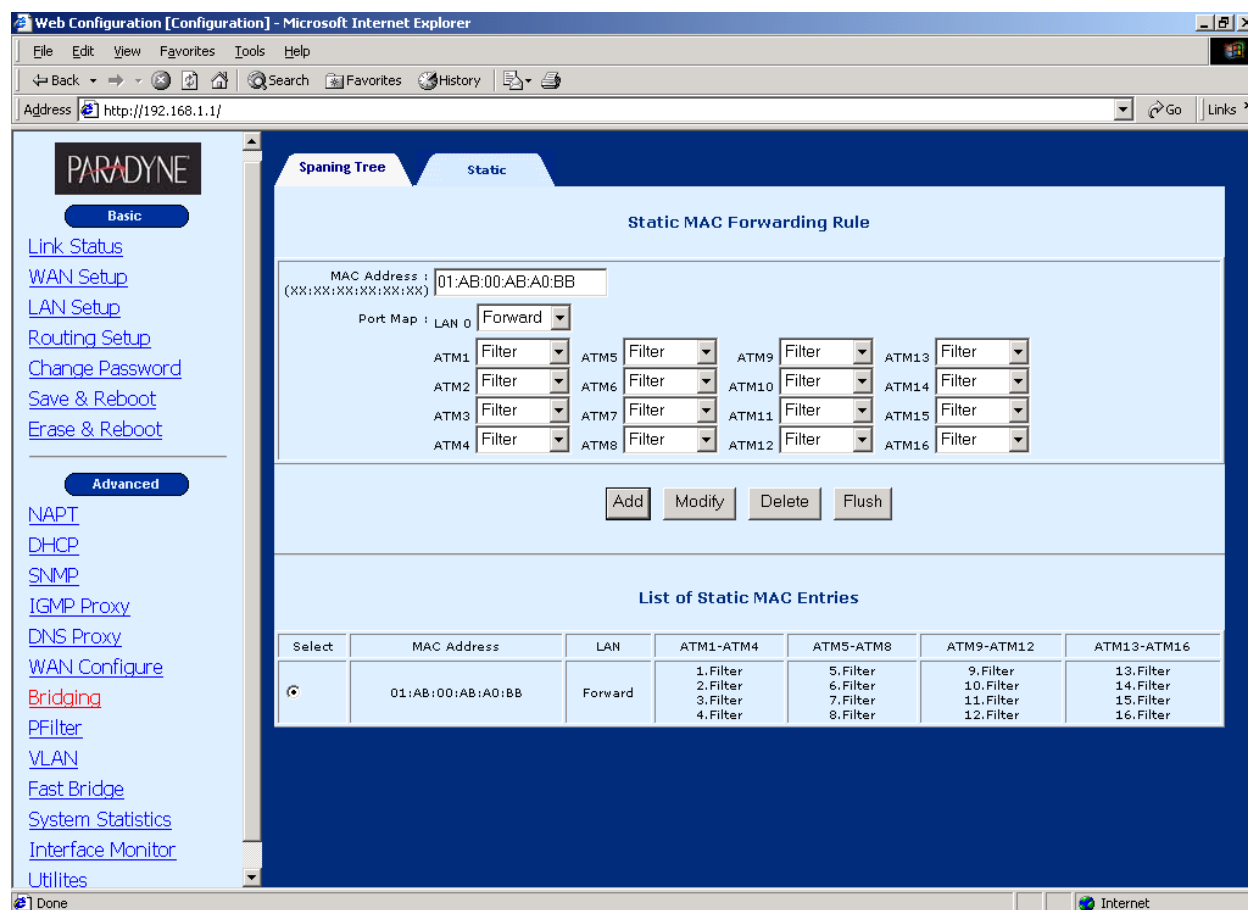
**Spanning Tree Configuration**

Spanning Tree :	<input type="radio"/> Disable <input checked="" type="radio"/> <b>Enable</b>	Bridge Priority (0 - 65535) :	32768
LAN Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM1 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM2 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM3 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM4 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM5 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM6 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM7 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM8 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM9 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM10 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM11 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM12 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM13 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM14 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM15 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128
ATM16 Operation Mode :	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	Port Priority (0 - 255) :	128

**Apply**

### 3.6.2 Static Bridging (MAC filter)

Click on the **Static** tab to configure, modify, and delete the MAC filter functions.



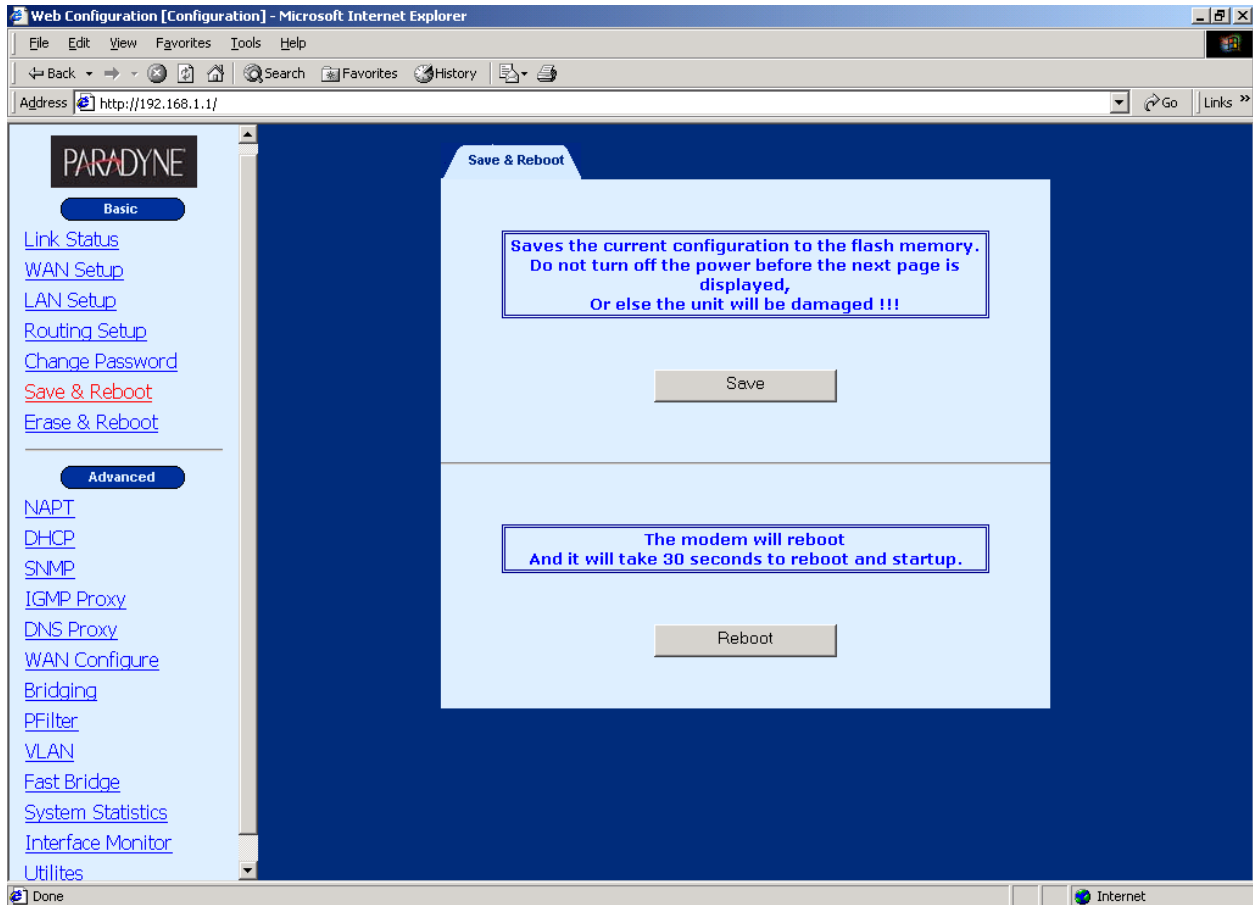
<b>Add</b>	Add a static bridging entry
<b>Modify</b>	Modify the static bridging entries
<b>Delete</b>	Delete a static bridging static entry
<b>Flush</b>	Delete all the static bridging entries

- **MAC Address:** This is the MAC address of the PC. Each PC has a unique MAC address, such as 0a:01:1a:11:00:0b.
- **Port Map:** There are three modes to set up the data processing method for the LAN and ATM interfaces: **filter**, **forward**, and **dynamic**. For example, if the Port Map is set to: LAN – Forward, and others- Filter, it means the packets will be forwarded to the LAN interface and will not reach the ATM interfaces. In dynamic mode, the operating mode of the MAC address in the interface follows the learning result of the bridging function.

### 3.6.3 Write System Configurations

The new parameters can function immediately without being saved to the flash memory. To use these parameters after you restart the router, you must save them to the flash memory.

To write the configurations, click on the **Save & Reboot** button. Click on the **Save** button on the main screen. If you need to reboot the device after writing the configurations, also click on the **Reboot** button.



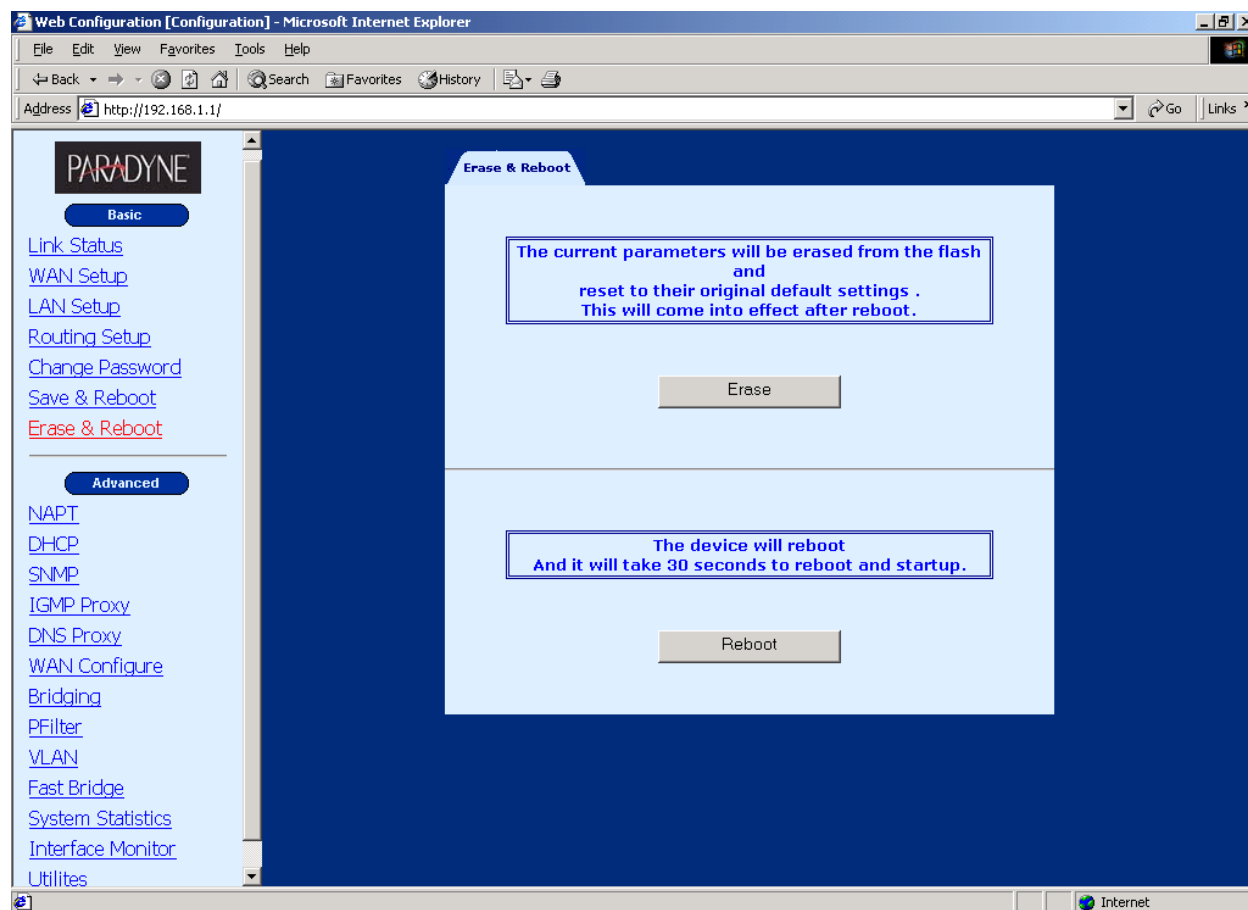
### 3.6.4 Load Factory Default Values

**Caution!** If you reset your device to the factory defaults, any changes to parameters will be lost and all parameters will revert to their default values.

To retrieve the factory default settings:

**STEP 1:** Click **Erase & Reboot** on the Basic menu bar.

**STEP 2:** Click **Erase** and **Reboot** respectively.



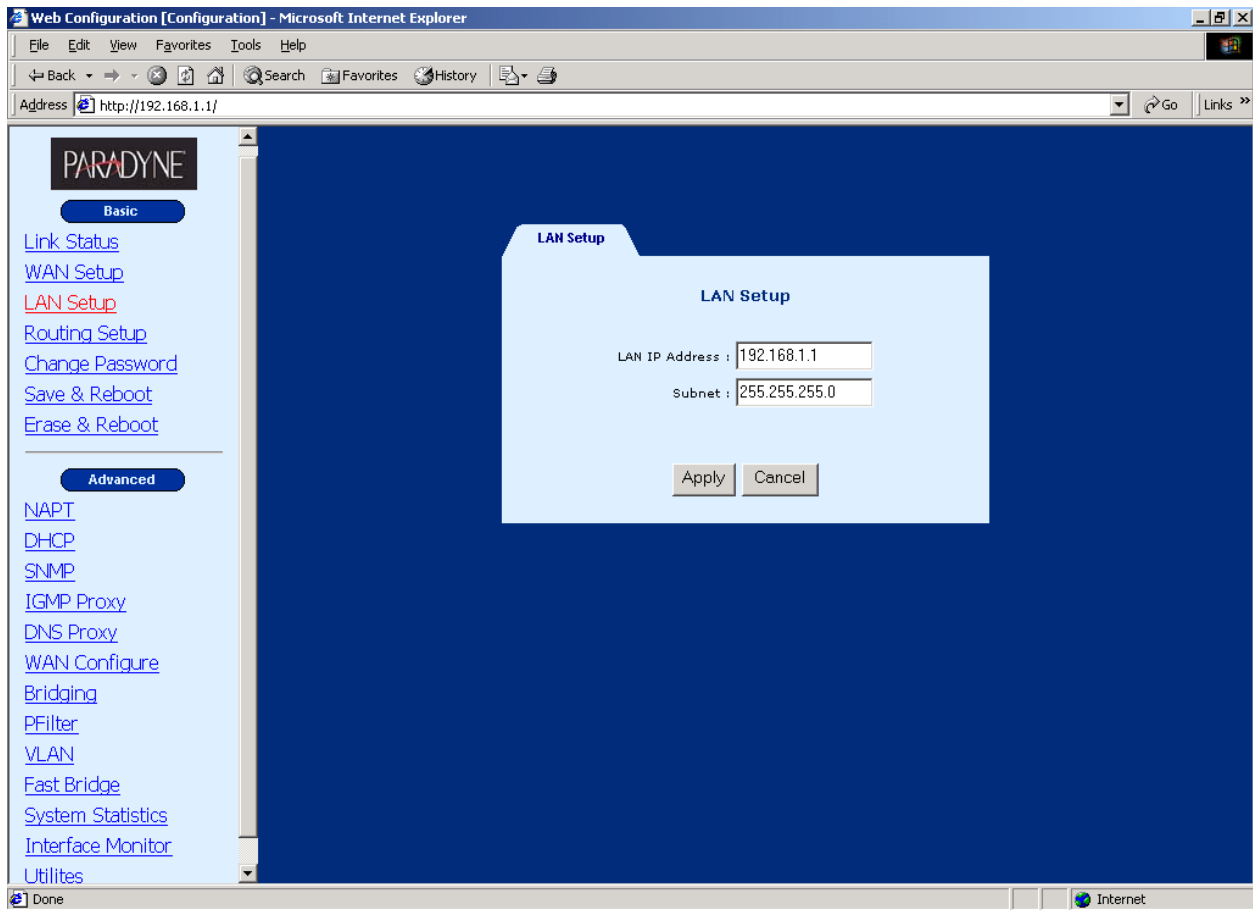


## CHAPTER 4 Setting up WAN and LAN Interfaces

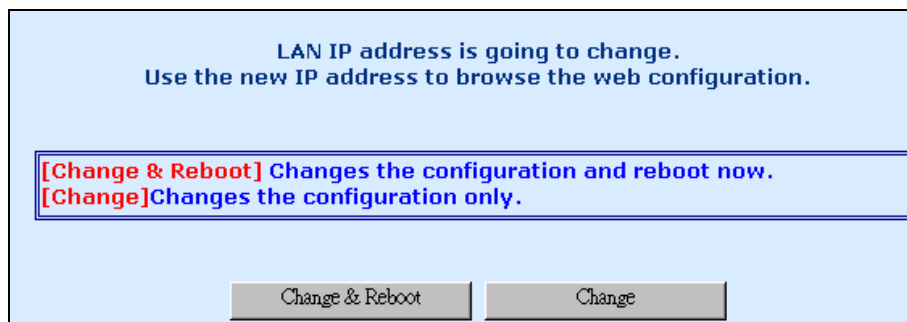
### 4.1 LAN Interface

To set up the Ethernet Interface:

**STEP 1:** Click **LAN Setup** on the Basic Menu bar.



**STEP 2:** Enter the new IP address and Subnet, and click on **Apply** to display the following screen.



**STEP 3:** You can click on the **Change & Reboot** button to use the new IP address and reset the device immediately. This does not require the Save action. Alternatively, you can click on the **Change** button to use the new IP address, but you need to save the new setting before you reset the router. After the IP address is changed, to be able to use the Web browser or Telnet, make sure your PC's IP address is set to the same network segment.

## 4.2 Configuring the WAN Interface

Click **WAN Setup** on the Basic menu bar and configure the VC to RFC 1483 Bridged, RFC 1483 Routed, PPPoE, or PPPoA. To set up these services, refer to Section 3.2.

**Web Configuration [Configuration] - Microsoft Internet Explorer**

Address: <http://192.168.1.1/>

**PARADYNE**

**Basic**

- [Link Status](#)
- [WAN Setup](#)
- [LAN Setup](#)
- [Routing Setup](#)
- [Change Password](#)
- [Save & Reboot](#)
- [Erase & Reboot](#)

**Advanced**

- [NAPT](#)
- [DHCP](#)
- [SNMP](#)
- [IGMP Proxy](#)
- [DNS Proxy](#)
- [WAN Configure](#)
- [Bridging](#)
- [PFilter](#)
- [VLAN](#)
- [Fast Bridge](#)
- [System Statistics](#)
- [Interface Monitor](#)
- [Utilities](#)

**WAN Setup**

VPI:  VCI:  ☒ LLC/SNAP ☐ Vc Multiplexing ☐ Enable NAPT

☒ **RFC1483 Bridged**

☐ **RFC1483 Routed**

WAN IP address:  WAN subnet mask:

☐ **PPPoE (NAT Enabled)**

User name:  Password:

Mode:  Idle Timeout(min):  ☐ Enable DHCP Server

Keepalive Interval(sec):

☐ **PPPoA (NAT Enabled)**

User name:  Password:

Keepalive Interval(sec):

**Current ATM PVC List**

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	Keepalive Interval	PPPoE Mode	Status
<input checked="" type="radio"/>	Bridged	0	35	LLC	OFF	-	-	-	-	0	0	-	Down

Internet

### 4.2.1 VC Data Flow Control

To set up the flow control parameters, such as AAL5 encapsulation, QOS, Peak Cell Rate, Sustainable Cell Rate, and Burst Tolerance, follow the steps below.

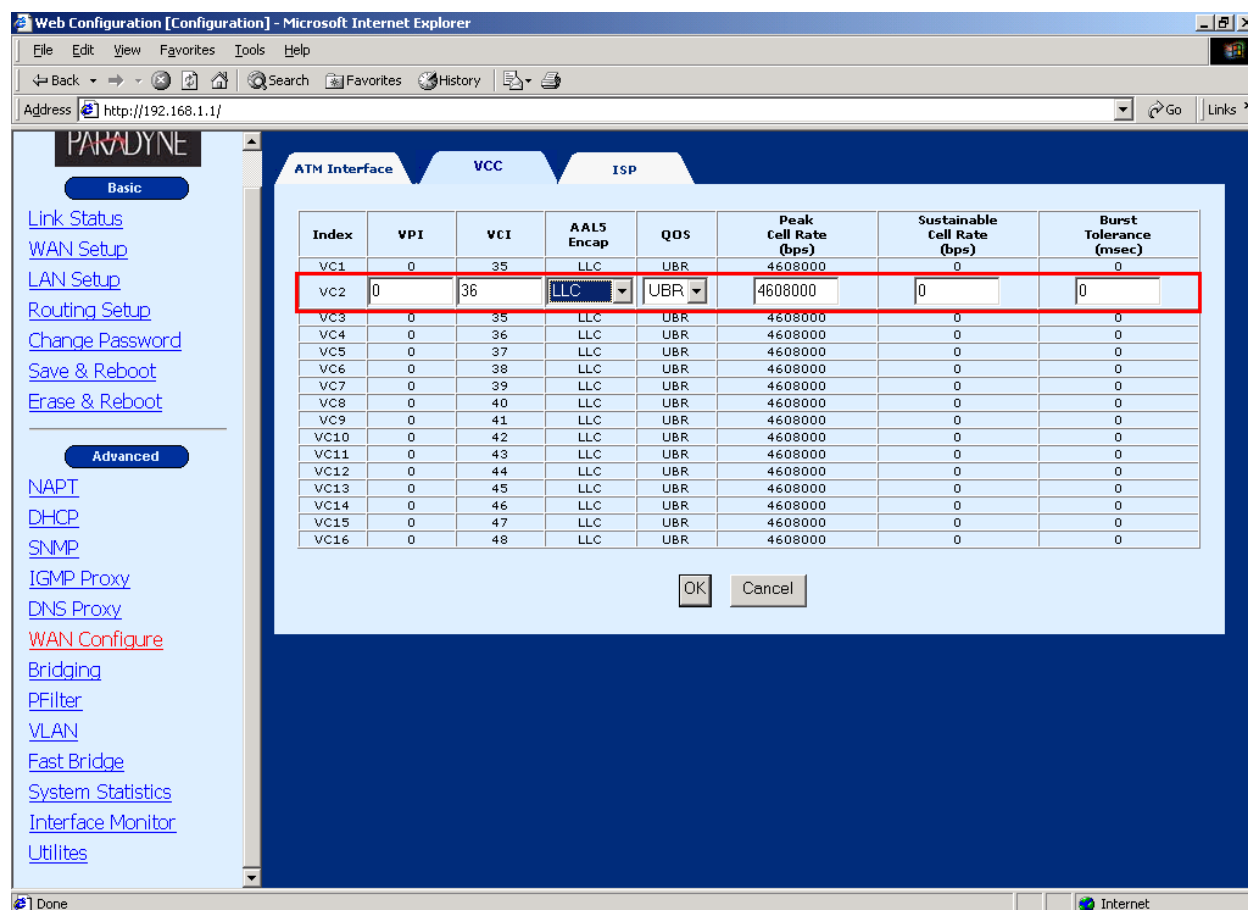
Click **WAN Configure** on the Advanced menu bar, and click on the **VCC** tab on the main menu.

The screenshot shows the Paradyne Web Configuration interface in Microsoft Internet Explorer. The browser address bar shows <http://192.168.1.1/>. The interface has a left sidebar with navigation links under 'Basic' and 'Advanced' tabs. The 'VCC' tab is selected in the main content area. Below the tabs is a table with 8 columns: Index, VPI, VCI, AAL5 Encap, QOS, Peak Cell Rate (bps), Sustainable Cell Rate (bps), and Burst Tolerance (msec). The table lists 16 VCs (VC1 to VC16). VC2 is highlighted with a red box. Below the table is a 'Modify' button.

Index	VPI	VCI	AAL5 Encap	QOS	Peak Cell Rate (bps)	Sustainable Cell Rate (bps)	Burst Tolerance (msec)
VC1	0	35	LLC	UBR	4608000	0	0
VC2	0	34	LLC	UBR	4608000	0	0
VC3	0	35	LLC	UBR	4608000	0	0
VC4	0	36	LLC	UBR	4608000	0	0
VC5	0	37	LLC	UBR	4608000	0	0
VC6	0	38	LLC	UBR	4608000	0	0
VC7	0	39	LLC	UBR	4608000	0	0
VC8	0	40	LLC	UBR	4608000	0	0
VC9	0	41	LLC	UBR	4608000	0	0
VC10	0	42	LLC	UBR	4608000	0	0
VC11	0	43	LLC	UBR	4608000	0	0
VC12	0	44	LLC	UBR	4608000	0	0
VC13	0	45	LLC	UBR	4608000	0	0
VC14	0	46	LLC	UBR	4608000	0	0
VC15	0	47	LLC	UBR	4608000	0	0
VC16	0	48	LLC	UBR	4608000	0	0

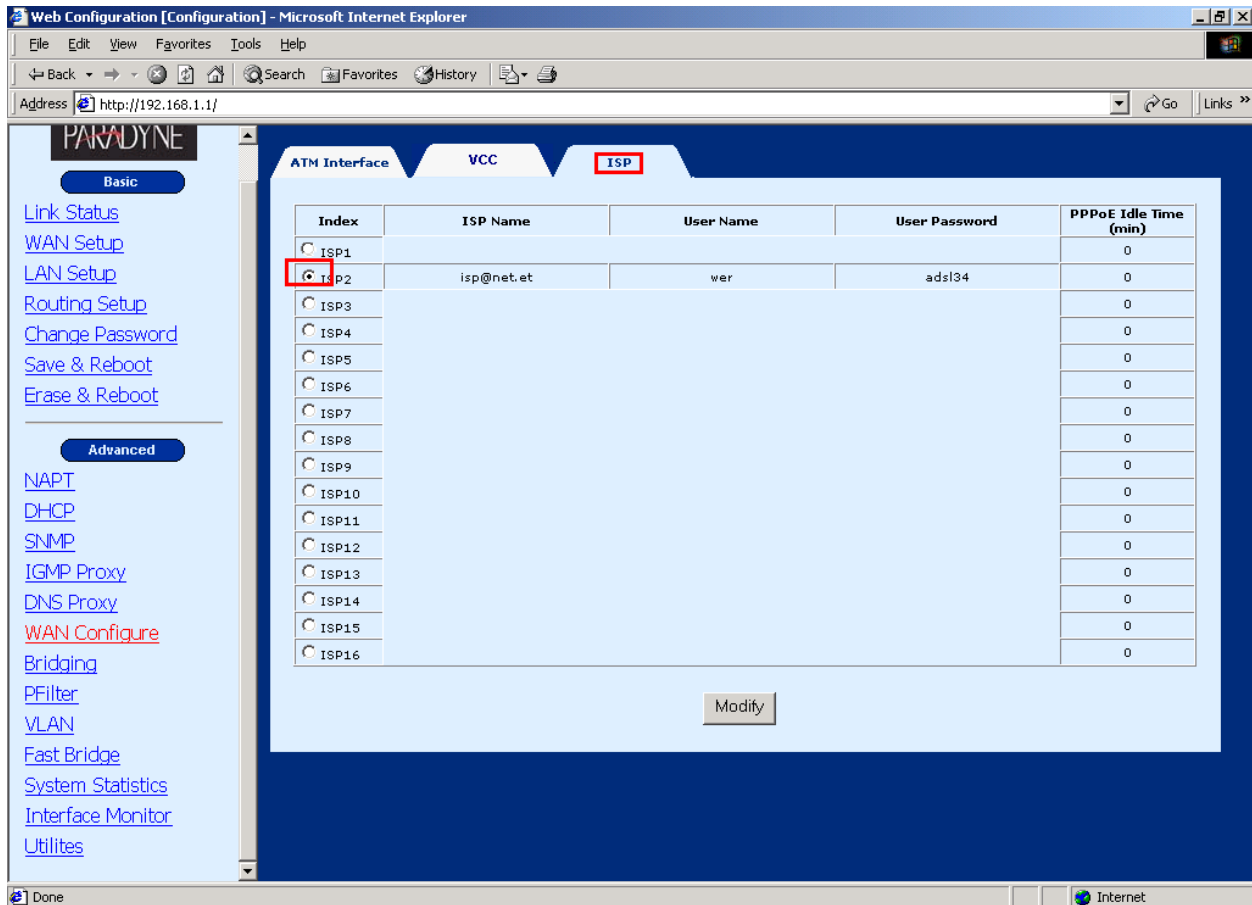
Modify

Select a VC in the Index field and click on the **Modify** button to configure the VC's flow control parameters. Click on **OK** to complete the settings.

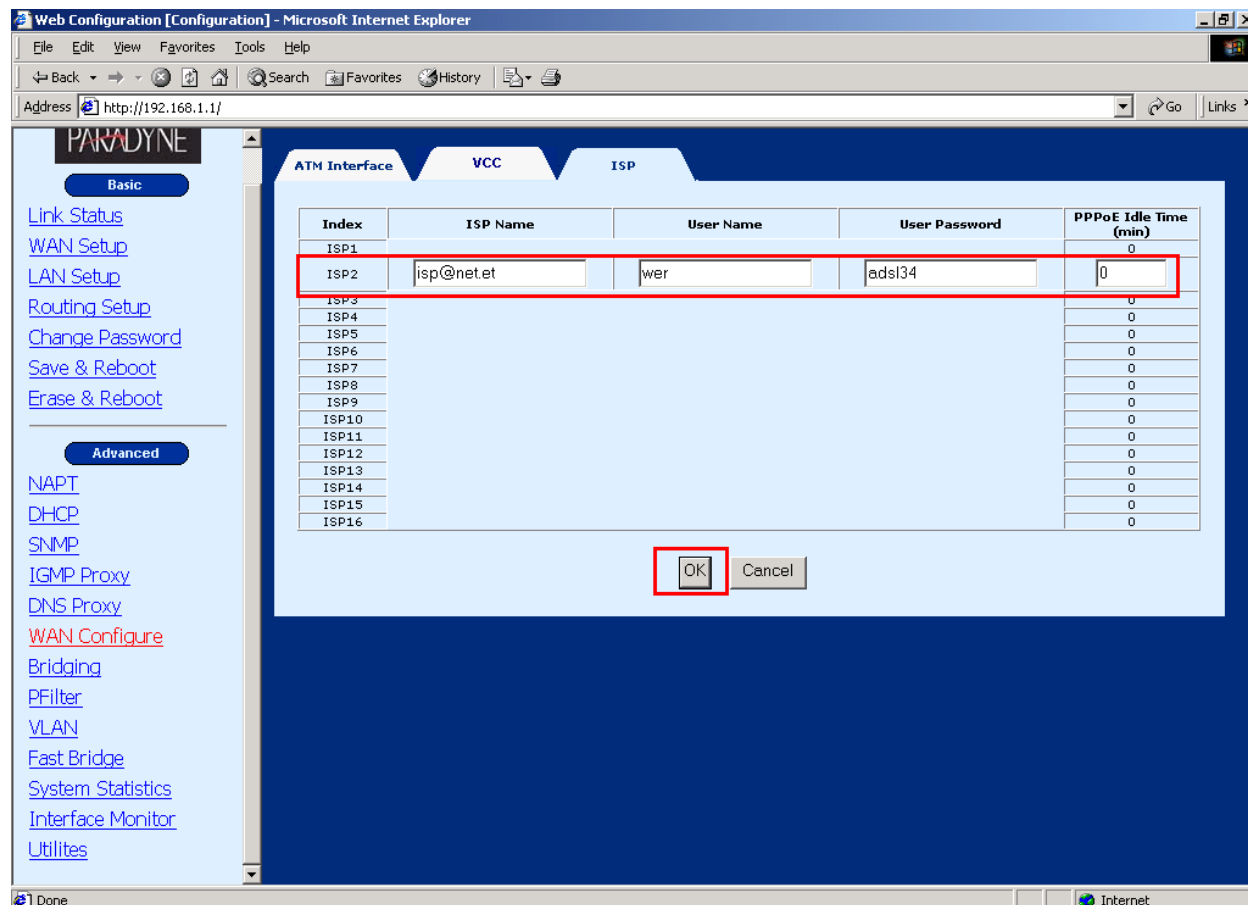


## 4.2.2 Setting up an ISP

The router supports connection to up to 16 ISPs. Each ATM Interface can connect to an ISP. To set up or configure the connection parameters to ISP, click on **WAN Configure** on the Advanced menu bar. Click on the **ISP** tab on the main screen.



Select an ISP and click on the **Modify** button on the bottom screen. After modifying the parameters, click on **OK** to complete the settings.

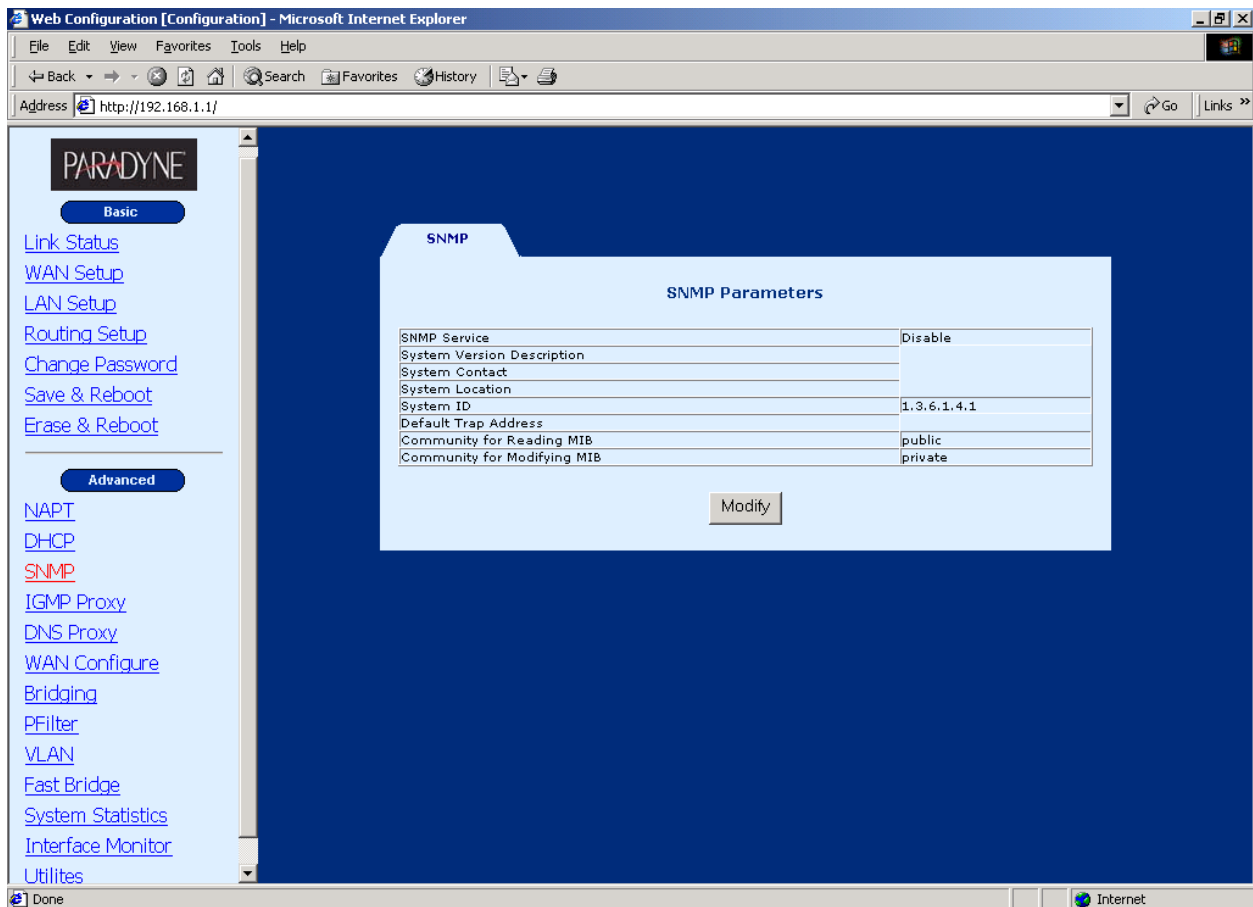


## CHAPTER 5 SNMP

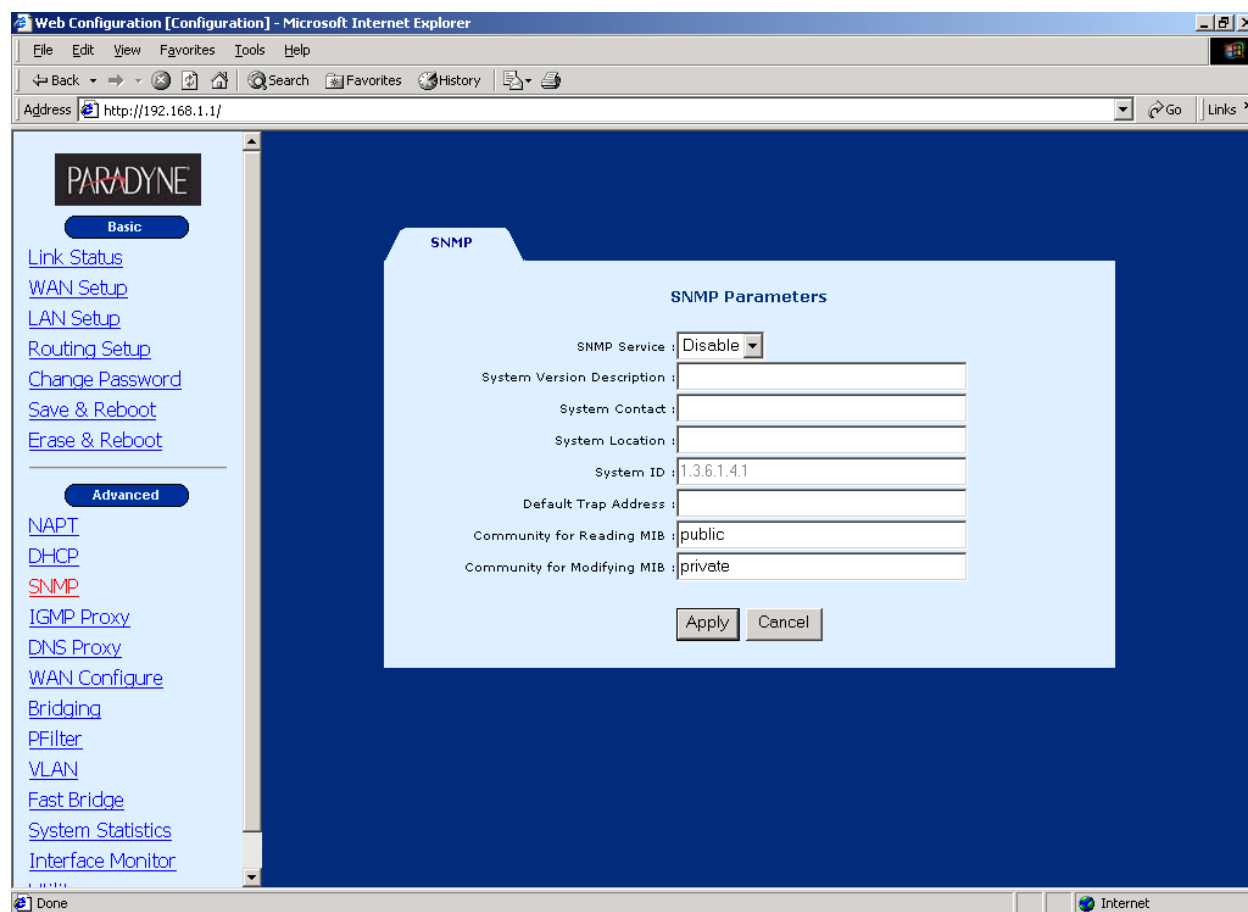
The default setting of the SNMP function is enabled. SNMP is a software entity that responds to information and action request messages sent by a network management station. The messages exchanged enable you to access and manage objects in an active or inactive (stored) MIB on a particular router.

### 5.1 Enable SNMP

To configure the SNMP parameters, click on the **SNMP** button on the Advanced menu bar. The window displays the SNMP parameters.



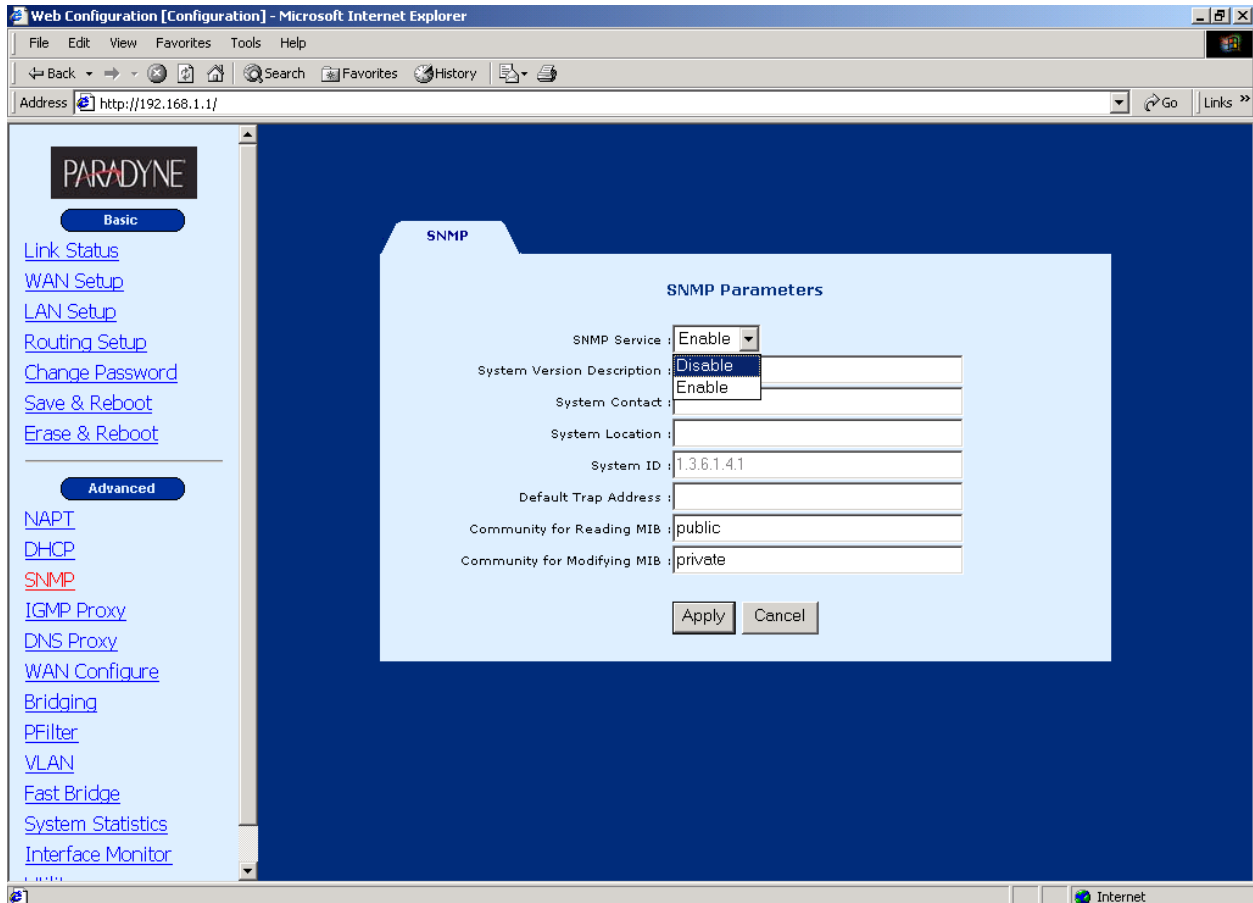
To modify the SNMP parameters, click on the **Modify** button at the bottom of the screen. Click **Apply** to submit the settings.





## 5.2 Enable SNMP

The default SNMP function is disabled. To enable it, click **SNMP** on the **Advanced** menu bar and click on the **Modify** button at the bottom of the screen. Choose **Enable** in the SNMP Service field and click on **Apply** to submit the setting.



## CHAPTER 6 Packet Filter

Packet filter, a firewall security measure, examines incoming and outgoing packet headers (IP address, port number, and so on) on the network and determines whether to forward the packets based on user-defined rules (deny, accept, and count).

The SHDSL router provides packet filter and stateful packet inspection. It has denial of service protection against attacks such as ICMP Flood, Ping of Death, IP spoofing, Port Scans, Land Attacks, Tear Drop Attacks, IP Source Route and WinNuke Attacks.

To access the packet filter functions, select **PFilter** from the advanced menu. The screen will display as below, showing a list of the currently configured filter entries.

**Packet Filter Setup**

Packet Filter Status : ☒ Enable ☐ Disable

Apply

**Rule Parameter**

Priority:

Protocol:

TCP Flag[Fin.Syn.Rst.Psh.Ack.Urg]:

Source IP:  MASK:

Destination IP:  MASK:

Action:  Direction:  Interface:

Add Modify Delete

**Current PF Rules List**

Select	Priority	Protocol	TCP Flags	SRC IP	SRC Mask	SRC Port	DST IP	DST Mask	DST Port	Action	Direction	Interface	Message Log
<input type="radio"/>	65535	ip	XXXXXX	any	-	-	any	-	-	accept	Both	ANY	OFF

## 6.1 Add a Packet Filter entry

To add a Packet Filter, complete the following steps:

**STEP 1:** Enter values for the parameters (explained below).

**STEP 2:** Click on the **Add** button.

**STEP 3:** Click on the **Apply** button at the bottom of the page.

Priority	You can enter a number here to assign the priority of a filter, in case there are overlapping rules. The lower the number the higher its priority.
Protocol	Select from TCP/UDP/ICMP/IP.
Source IP	Source IP of a packet you wish to filter.
Source Mask	Source Mask of a packet.
Source Port	Source Port of a packet you wish to filter.
Destination IP	Destination IP of a packet you wish to filter.
Destination Mask	Destination Mask of a packet.
Destination Port	Destination Port of a packet you wish to filter.
TCP Flag ([F.S.R.P.A.U])	This field allows you to filter according to a TCP flag.
Action	<p>This field determines the action the router will take when it receives a packet that corresponds to a filtering rule. It can be set to:</p> <p><b>allow</b>, to let the packet pass through the filter.</p> <p><b>deny</b>, to drop the packet.</p> <p><b>count</b>, which has no effect on whether the packet will be allowed through the filter, causes the packet to be included in the accounting statistics kept by the filter.</p>
Interface	<p>You can choose to apply this setting to a specific LAN or ATM interface. This function is called <b>Packet Binding</b>.</p> <p><b>Packet Binding</b> is a function that can be used when we have multiple Virtual Channels (VC) and we are utilizing IP Packet Filtering. In some cases, we may not wish to apply the packet filtering to all VCs. In this case, we can bind IP packet filtering to a VC. This means that filtering will only be applied to the bound VC, and thus the remaining VCs will not filter packets.</p>
Direction	This field determines whether the rule applies to <b>Inbound</b> , <b>outbound</b> or <b>both</b> directions

## 6.2 Delete a Packet Filter entry

To **delete an entry**, select an entry from the list, and click on **Delete**.

## 6.3 Enable/Disable Packet Filter

If you wish to Enable or Disable the Packet Filter, click **Enable** or **Disable** and click on the **Apply** button.

## CHAPTER 7 Routing

This chapter describes how to set up the static routes and RIP. Click **Routing Setup** from the Basic menu bar to configure the routing functions.

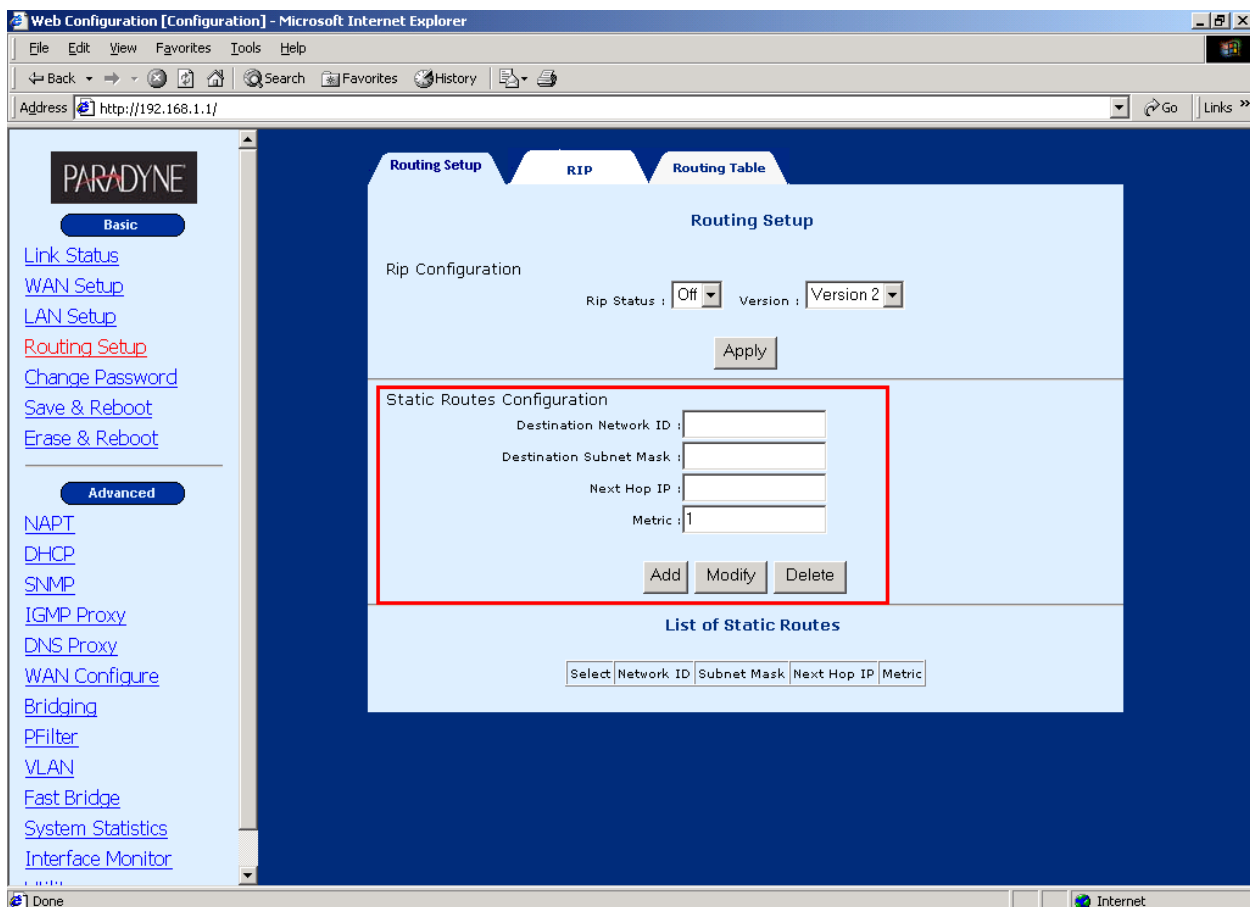
### 7.1 Static Route

The Static Route Configuration field allows you to add, modify, and delete a static route. Type the Destination Network ID, subnet mask, and next hop IP and click a button below to perform the requested function.

The router has no default static route. After an RFC 1483-routed VC is created, a static route as follows will be created.

Network ID	Subnet Mask	Next Hop IP
0.0.0.0	0.0.0.0	10.0.0.2

Click **Routing Setup** on the Basic menu bar to access the Routing Setup window. It allows adding, modifying, and deleting the static routes.



**Add:**

To add a static route complete the following steps:

**STEP 1:** Enter the parameters for Destination Network ID, Subnet Mask, Next Hop IP

**STEP 2:** Click on the **ADD** button

**Modify:**

To modify a static route complete the following steps:

**STEP 1:** Select the entry you wish to modify from the List of Static Routes

**STEP 2:** Change the parameters

**STEP 3:** Click on the **Modify** button

**Delete:**

**STEP 1:** Select the entry you wish to **delete** from the List of Static Routes

**STEP 2:** Change the parameters

**STEP 3:** Click on the **Delete** button

## 7.2 Set Up the RIP function

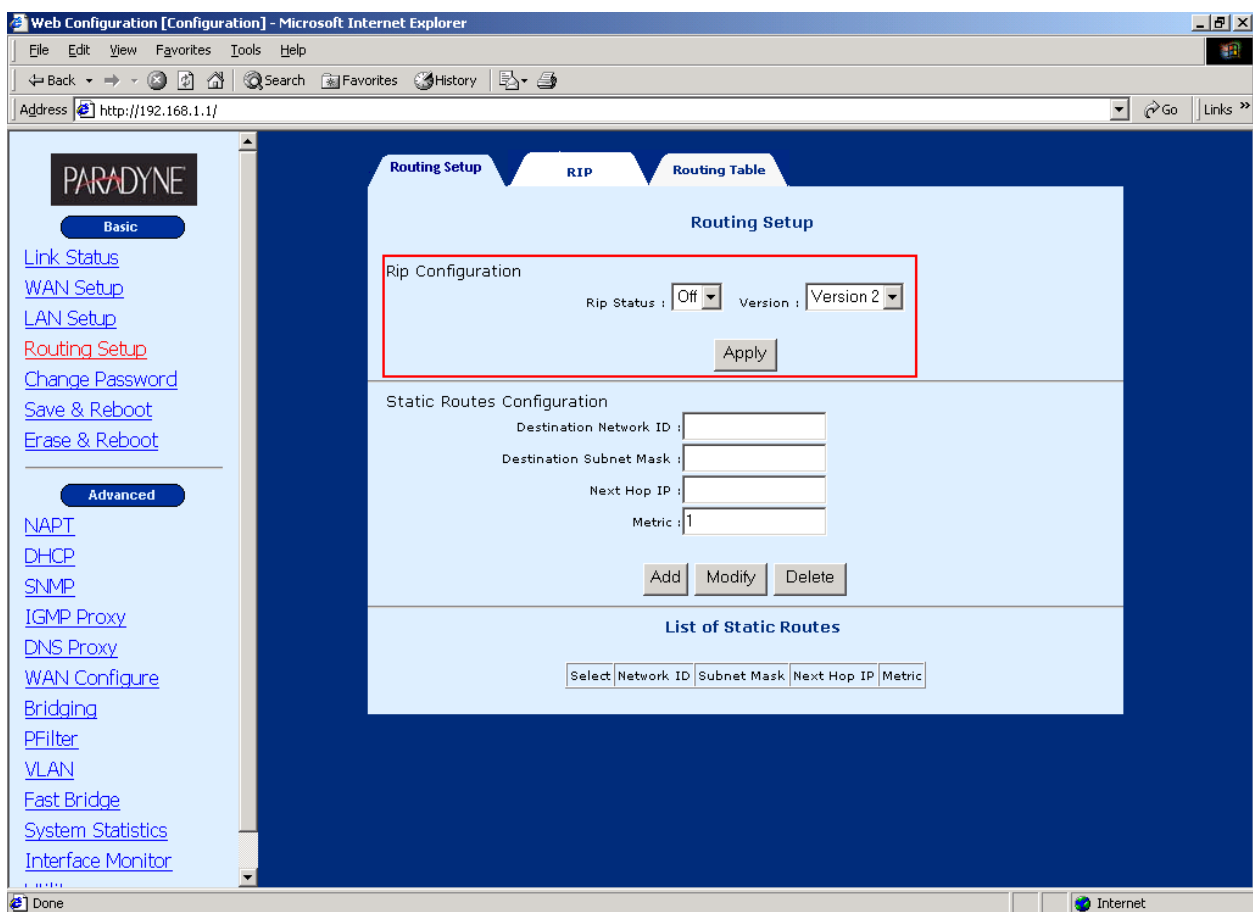
To enable the RIP, complete the following steps:

**STEP 1:** Click **Routing Setup** from the Basic menu bar

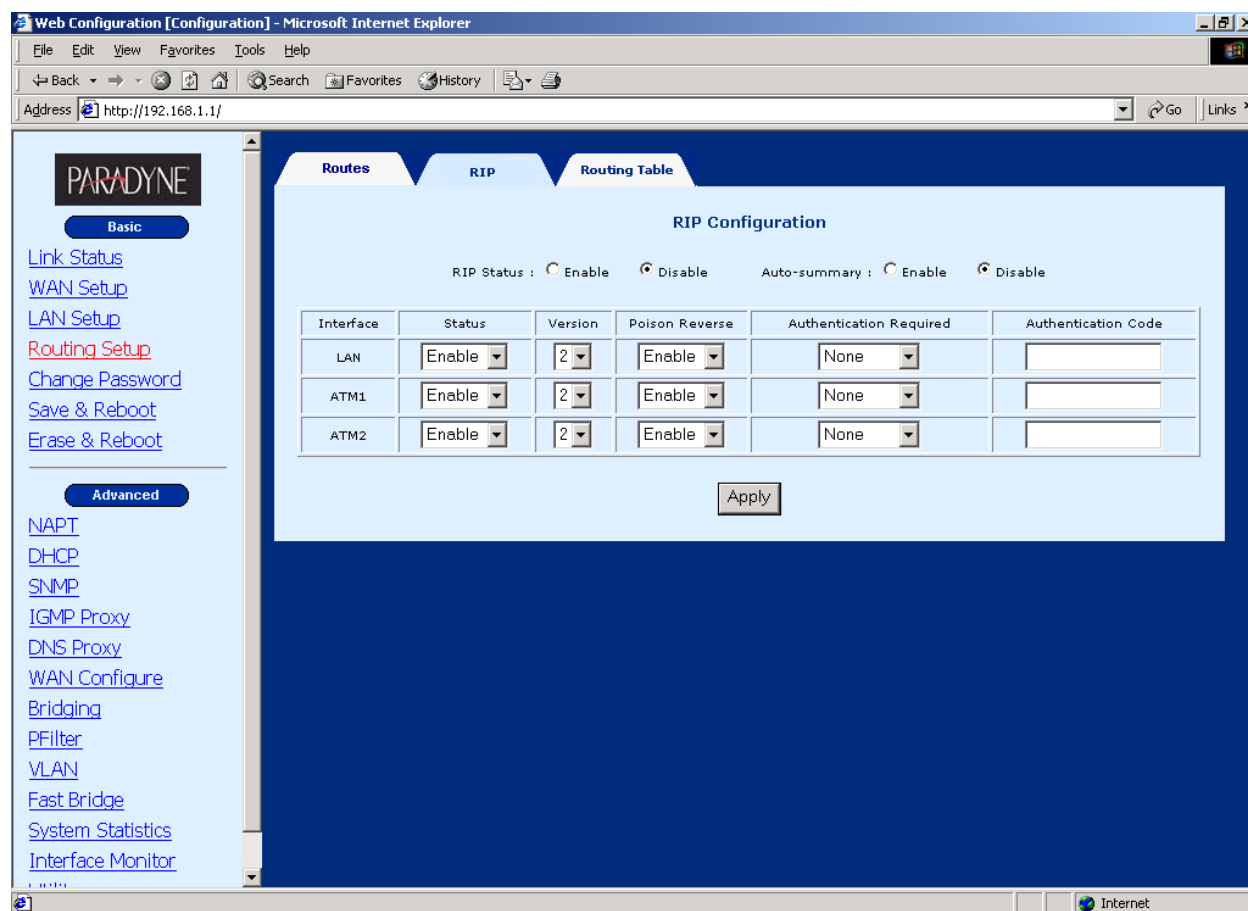
**STEP 2:** Select **On** in the Rip Status field.

**STEP 3:** Select a RIP Version (Version 1 or Version 2) from the Version field.

**STEP 4:** Click **Apply** to submit the settings.



To configure the advance functions of the RIP, click on the **RIP** tab on the main screen, and configure the requested parameters.



Mode:	Select <b>Enabled</b>
Version:	RIP version 2 or version 1
Authentication:	<p><b>none:</b> no authentication code is required.</p> <p><b>PlainText:</b> an authentication code is required. You should also fill in the Authentication Code field to assign a password.</p> <p><b>MD5:</b> an authentication code is required. You should also fill in the Authentication Code field to assign a password.</p>



Poison Reverse:	<p><b>Enabled:</b> to enable the Poison Reverse</p> <p><b>Disabled:</b> to enable the Splitting Horizon</p> <p>The default setting of poison reverse parameter is <b>Enabled</b>.</p> <p>It means the router adopts the <u>split horizon with poison reverse</u> scheme to avoid routing loop problems. If the parameter is <b>disabled</b>, the router will use the <u>simple split horizon</u> scheme to solve the problem.</p>
Authentication Code:	Enter the password for authentication.

- Mode: Enabled
- Auto Summary: Enabled, Disabled

The RIP function is now enabled. The default RIP parameter for each interface is RIPv2. In this default mode, this router can operate normally without other adjustments.

### 7.3 Displaying the Routing Table

To display the routing table, you can enter either of the following screens:

- BASIC/ROUTING SETUP/ROUTING TABLE screen
- Advance/Utilities/Routing Table

The following routing table appears after clicking Basic>Routing Setup>Routing Table.

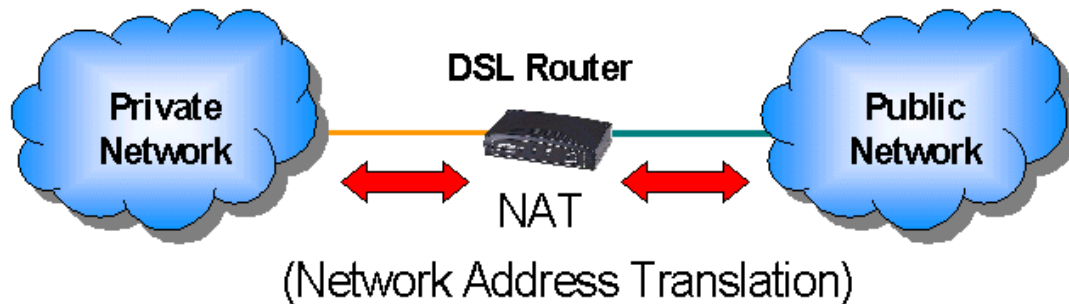
The screenshot shows a web browser window titled "Web Configuration [Configuration] - Microsoft Internet Explorer". The address bar shows "http://192.168.1.1/". The left sidebar contains the Paradyne logo and a menu with "Basic" and "Advanced" sections. The "Basic" section includes links for Link Status, WAN Setup, LAN Setup, Routing Setup, Change Password, Save & Reboot, and Erase & Reboot. The "Advanced" section includes links for NAPT, DHCP, SNMP, IGMP Proxy, DNS Proxy, WAN Configure, Bridging, PFilter, VLAN, Fast Bridge, System Statistics, and Interface Monitor. The main content area has three tabs: "Routes", "RIP", and "Routing Table", with "Routing Table" selected. Below the tabs is a notation: "Notation : C - connected, S - static, R - RIP, I - ICMP Redirect". A table displays the routing information:

Type	Network Address	Subnet Mask	Gateway	Interface	Metric
C	192.168.1.0	255.255.255.0	192.168.1.1	LAN	0

Below the table is a "Refresh" button. The browser status bar at the bottom shows "Done" and "Internet".

## CHAPTER 8 NAT

Network Address Translation (NAT or NAPT) is a transparent routing function that translates a private IP address on a LAN into a public address that can be used in a public network. Port Address Translation (PAT) is a form of NAT that maps multiple private IP addresses to a single public IP address. Port numbers (TCP or UDP) ensure that packets are delivered properly. Both Network Address Translation (NAT) and Port Address Translation (PAT) are supported by this router. NAT and PAT are common solutions for: overcoming the shortage of public IP addresses, security (private IP addresses are not transparent), and assisting network administration.



The router supports many types of NAT functions, including:

- Fixed-NAT: this maps a private IP address to a public IP address.
- Multi-NAT: this maps multiple private IP addresses to multiple public IP address.
- PAT: When private IP addresses are more than public IP addresses, port address translation is supported to translate the public IP addresses.

Note the usage of synonyms below:

Local: private, illegal, unregistered

Public: legal, registered

In PPPoE or PPPoA mode, the NAT function is automatically enabled. In RFC 1483 Routed mode, to enable NAT, you must select the Enable NAPT item on the WAN Setup screen.

The following pages describe how to set up a virtual server (Redirect port) and different types of NAT.

## 8.1 Multiple to One

This application requires a series of private IP addresses (such as 192.168.1.140- 192.168.1.150). These private IP address share a public IP address, such as 10.1.1.1.

**STEP 1:** Click on **NAPT** on the Advanced menu bar.

**STEP 2:** Click on **PAT** and enter the following parameters:

- **Start Private IP Address:** Type the first IP address. For example, 192.168.1.140
- **End Private IP Address:** Type the last IP address. For example, 192.168.1.150
- **Global IP Address:** Type the public IP address. For example, 10.1.1.1.

**STEP 2:** Click on the **Add** button to submit the settings.

The screenshot shows the Paradyne Web Configuration interface in Microsoft Internet Explorer. The left sidebar contains a menu with 'Basic' and 'Advanced' tabs, and various configuration links. The 'Advanced' tab is selected, and the 'NAPT' option is highlighted. The main content area is titled 'NAPT Configuration' and contains a form for configuring NAPT settings. The 'PAT' radio button is selected, and the 'Start local IP Address' is set to 192.168.1.140, 'End local IP Address' is set to 192.168.1.150, and 'Public IP Address' is set to 10.1.1.1. Below the form are 'Add', 'Modify', and 'Delete' buttons. At the bottom, there is a 'List of NAPT Entries' table.

Select	local IP Address	Public IP Address	Mode
<input checked="" type="radio"/>	192.168.1.140	192.168.1.150	10.1.1.1
			PAT

## 8.2 One to One NAT

One-to-one NAT maps a private IP address to a public IP address, such as 192.168.1.10 to 10.1.1.34.

Click **NAPT** on the **Advanced** menu bar and click on the **NAT/PAT** tab to access the NAT/PAT Configuration screen.

Follow the steps below:

**STEP 1:** Select Fixed-NAT.

**STEP 2:** Type the private IP address in the **Private IP Address** field (for example, 192.168.1.233), and type the public IP address in the **Public IP Address** field.

**STEP 3:** Click on the **Add** button

Web Configuration [Configuration] - Microsoft Internet Explorer

Address: http://192.168.1.1/

**PARADYNE**

**Basic**

[Link Status](#)  
[WAN Setup](#)  
[LAN Setup](#)  
[Routing Setup](#)  
[Change Password](#)  
[Save & Reboot](#)  
[Erase & Reboot](#)

**Advanced**

[NAPT](#)  
[DHCP](#)  
[SNMP](#)  
[IGMP Proxy](#)  
[DNS Proxy](#)  
[WAN Configure](#)  
[Bridging](#)  
[PFilter](#)

**NAPT** **NAT/PAT**

**NAPT Configuration**

☐ PAT Start local IP Address : End local IP Address :  
Public IP Address :

☒ **Fixed-NAT** local IP Address : 192.168.1.233  
Public IP Address: 10.1.1.30

☐ Multi-NAT Start local IP Address : End local IP Address :  
☐ overload Start Public IP Address : End Public IP Address :

**Add** **Modify** **Delete**

**List of NAPT Entries**

Select	local IP Address		Public IP Address		Mode
<input checked="" type="radio"/>	192.168.1.233	192.168.1.233	10.1.1.30	10.1.1.30	Fixed-NAT

### 8.3 Multi-NAT

Multi-NAT maps a set of continuous private IP addresses to a set of continuous public IP addresses. There are two ways Multi-NAT can be used to translate the private IP addresses to public IP addresses. One way is to have each public IP address map to an individual private IP address. The other way is to have some of the private IP addresses share the same public IP address. This is required when there are fewer public IP addresses than private IP addresses.

**One-to-one mapping.** When the number of private IP addresses is less than or equal to the number of public IP addresses, each private IP address can be mapped to a public IP address. The following parameters are used:

- Start Private IP address- End Private IP Address: For example, 192.168.1.3- 192.168.1.22
- Start Global IP Address- End Global IP Address: For example, 10.1.1.3-10.1.1.22

The screenshot shows the Paradyne Web Configuration interface in Microsoft Internet Explorer. The address bar shows <http://192.168.1.1/>. The interface has a left sidebar with navigation links: Basic, Link Status, WAN Setup, LAN Setup, Routing Setup, Change Password, Save & Reboot, Erase & Reboot, Advanced, NAT, DHCP, SNMP, IGMP Proxy, DNS Proxy, WAN Configure, and Bridging. The main content area is titled 'NAPT Configuration' and has two tabs: 'NAPT' and 'NAT/PAT'. The 'NAT/PAT' tab is selected. Under 'NAPT Configuration', there are three radio buttons: 'PAT', 'Fixed-NAT', and 'Multi-NAT'. The 'Multi-NAT' radio button is selected. Below the radio buttons are four input fields: 'Start local IP Address' (192.168.1.3), 'End local IP Address' (192.168.1.22), 'Start Public IP Address' (10.1.1.3), and 'End Public IP Address' (10.1.1.22). There is an 'overload' checkbox which is unchecked. Below the input fields are 'Add', 'Modify', and 'Delete' buttons. At the bottom, there is a table titled 'List of NAT Entries'.

Select	local IP Address	Public IP Address	Mode
<input checked="" type="radio"/>	192.168.1.3	192.168.1.22	10.1.1.3
			10.1.1.22
			Multi-NAT

**STEP 1:** Enter the above parameters

- Start Private IP address: For example, 192.168.1.3
- End Private IP Address: For example, 192.168.1.22
- Start Global IP Address: For example, 10.1.1.3
- End Global IP Address: For example, 10.1.1.22

**STEP 2:** Click on the **Add** button.

**Overload.** When the number of private IP addresses is greater than the number of public IP addresses, private IP addresses must share public IP addresses. The following parameters are used:

- Start Private IP address- End Private IP Address: For example, 192.168.1.3- 192.168.1.22
- Start Global IP Address- End Global IP Address: For example, 10.1.1.3-10.1.1.10

**Web Configuration [Configuration] - Microsoft Internet Explorer**

Address: <http://192.168.1.1/>

**PARADYNE**

**Basic**

[Link Status](#)  
[WAN Setup](#)  
[LAN Setup](#)  
[Routing Setup](#)  
[Change Password](#)  
[Save & Reboot](#)  
[Erase & Reboot](#)

**Advanced**

[NAPT](#)  
[DHCP](#)  
[SNMP](#)  
[IGMP Proxy](#)  
[DNS Proxy](#)  
[WAN Configure](#)  
[Bridging](#)

**NAPT Configuration**

☐ PAT Start local IP Address :  End local IP Address :   
Public IP Address :

☐ Fixed-NAT local IP Address :   
Public IP Address :

☒ Multi-NAT Start local IP Address :  End local IP Address :   
☒ Overload Start Public IP Address :  End Public IP Address :

**List of NAT Entries**

Select	local IP Address		Public IP Address		Mode
<input checked="" type="radio"/>	192.168.1.3	192.168.1.22	10.1.1.3	10.1.1.10	Multi-NAT

**STEP 1:** Fill out the above parameters in the relevant fields.

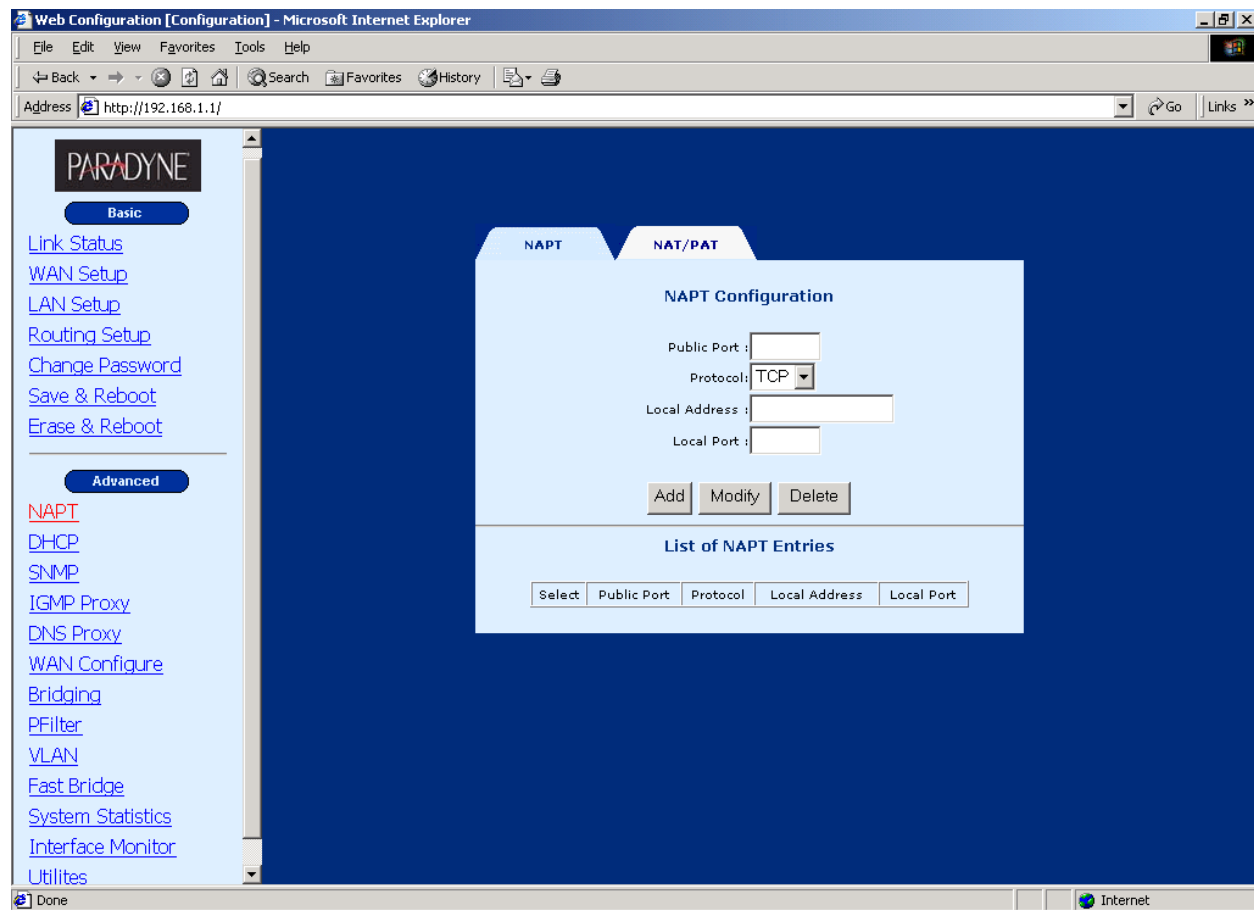
- Start Private IP address: For example, 192.168.1.3
- End Private IP Address: For example, 192.168.1.22
- Start Global IP Address: For example, 10.1.1.3
- End Global IP Address: For example, 10.1.1.10

**STEP 2:** Select Overload and click on the **Add** button.

## 8.4 Virtual Server

If you want to set up Internet servers (such as an e-mail server, web server, or FTP server) on the virtual LAN when PAT is enabled, you should register the servers with the router first to allow Internet users to access the service via the WAN interface of router. This section describes how to configure a virtual server.

Click on **NAPT** on the Advanced menu bar to access the NAPT Configuration screen.



- **Public Port:** The virtual server provides service for the Internet users via this port.
- **Protocol:** **TCP** or **UDP** (default: TCP).
- **Local Address:** This is the IP address of the Virtual Server
- **Local port:** This is the port that the virtual server is connected to the Ethernet.

After configuring the parameters, click **Add** to add an entry.

To modify the parameters, select an item from the List of NAPT Entries. Modify the parameters, and click on the **Modify** button.

To delete the parameters, select an item from the List of NAPT Entries. Click on the **Delete** button.



## CHAPTER 9 DHCP

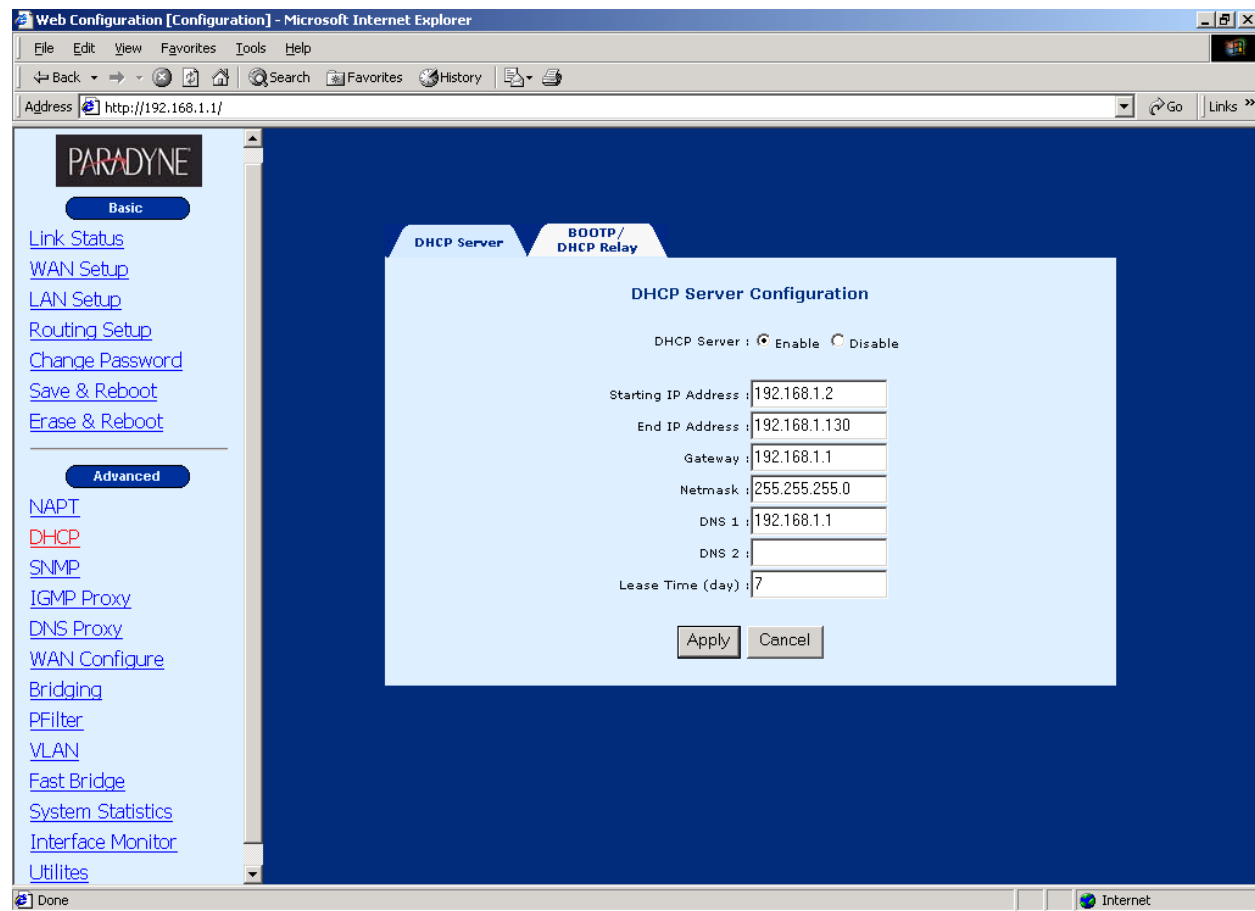
The router can be set as a Dynamic Host Configuration Protocol (DHCP) server or a DHCP relay. The former acts like an IP address pool. Upon power on, the PCs on the same domain will request an available IP address from the IP address pool of DHCP server. DHCP provides a centralized approach to allocating IP addresses. It allows IP addresses to be dynamically assigned on an as needed basis, from a pool of addresses. DHCP relay acts as an intermediate station. The DHCP server is at a remote location. PCs are directed to the remote location by the DHCP relay to obtain an available IP address.

### 9.1 DHCP Server

When a workstation is configured for automatic IP address assignment, it broadcasts a request to the LAN.

- When the router is configured as a DHCP server, the IP addresses in the DHCP pool should be at the same network segment as the DHCP server.
- DNS IP must be a valid parameter to activate the DHCP server to forward the DNS IP address to the workstations. The router supports DNS Proxy function. It can forward the name of the website to the correct DNS server to obtain the correct IP address.

To configure the router as a DHCP server, click on **DHCP** on the Advanced menu bar. Click **Enable** in the DHCP Server field, and fill out the parameters. Click **Apply** to submit the settings.

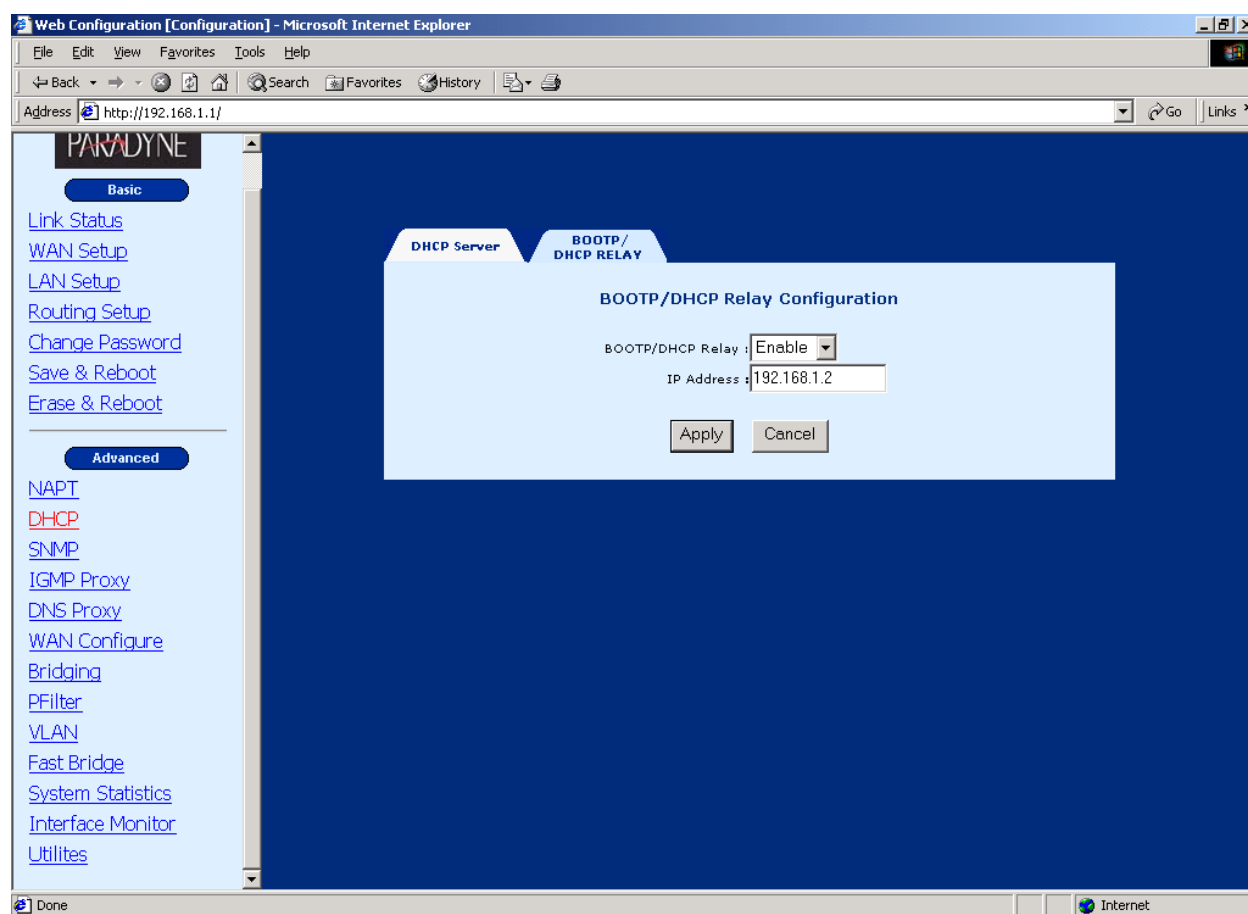


## 9.2 DHCP Relay

Click on **DHCP** on the Advanced menu bar. On the main screen, click on the **BOOTP/DHCP Relay** tab and configure the following parameters:

- BOOTP/DHCP Relay: Enable
- IP Address: This defines the IP address of the remote DHCP server.

After completing the settings, click **Apply** to submit the settings. Also, change the router's LAN IP address.

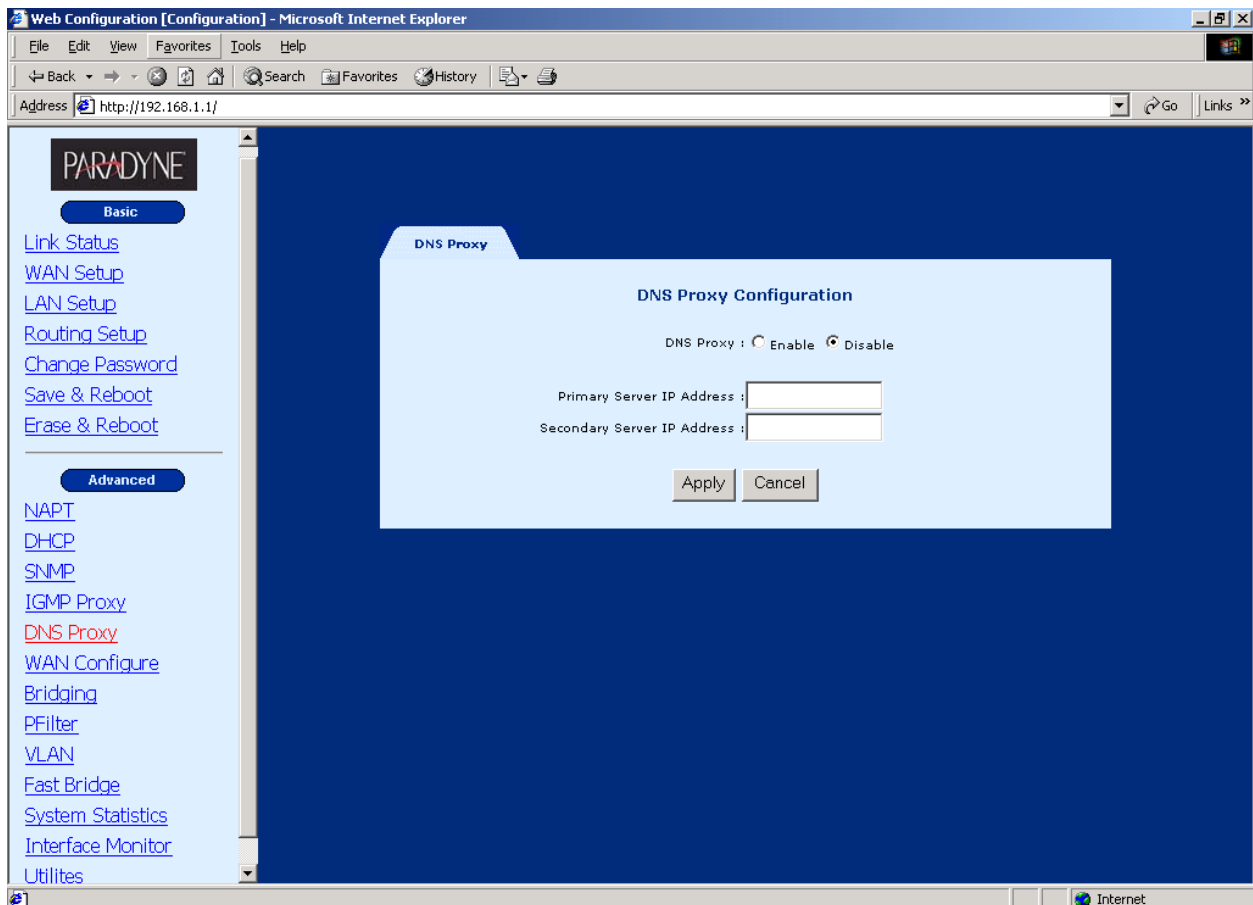


## CHAPTER 10 DNS Proxy

A Domain Name Server (DNS) provides an IP address to a host computer for an applied Domain Name. The router supports the DNS proxy feature, which receives and attempts to find an entry in its local tables, and when one is not found, it forwards the request to a remote server.

Click **DNS Proxy** on the Advance men bar and configure the following parameters:

DNS proxy:	Enabled/ Disabled (factory default: disabled)
Primary Server IP address:	Enter the primary server IP address
Secondary Server IP address:	Enter the secondary server IP address that will be used immediately when the primary server IP address fails or is not available



## CHAPTER 11 IGMP

IGMP (Internet Group Membership Protocol) is a protocol used by IP hosts to report their multicast group memberships to any immediately neighboring multicast routers.

**STEP 1:** Add a VC and set it to RFC 1483 Routed mode.

**Web Configuration [Configuration] - Microsoft Internet Explorer**

Address: <http://192.168.1.1/>

**PARADYNE**

**Basic**

[Link Status](#)  
[WAN Setup](#)  
[LAN Setup](#)  
[Routing Setup](#)  
[Change Password](#)  
[Save & Reboot](#)  
[Erase & Reboot](#)

**Advanced**

[NAPT](#)  
[DHCP](#)  
[SNMP](#)  
[IGMP Proxy](#)  
[DNS Proxy](#)  
[WAN Configure](#)  
[Bridging](#)  
[PFilter](#)  
[VLAN](#)  
[Fast Bridge](#)  
[System Statistics](#)  
[Interface Monitor](#)  
[Utilities](#)

**WAN Setup**

**WAN Setup**

VPI:  VCI:  ☒ LLC/SNAP ☐ Vc Multiplexing ☒ Enable NAPT

☐ RFC1483 Bridged

☒ **RFC1483 Routed**

WAN IP address:  WAN subnet mask:

☐ PPPoE (NAT Enabled)

User name:  Password:

Mode:  Idle Timeout(min):  ☐ Enable DHCP Server

Keepalive Interval(sec):

☐ PPPoA (NAT Enabled)

User name:  Password:

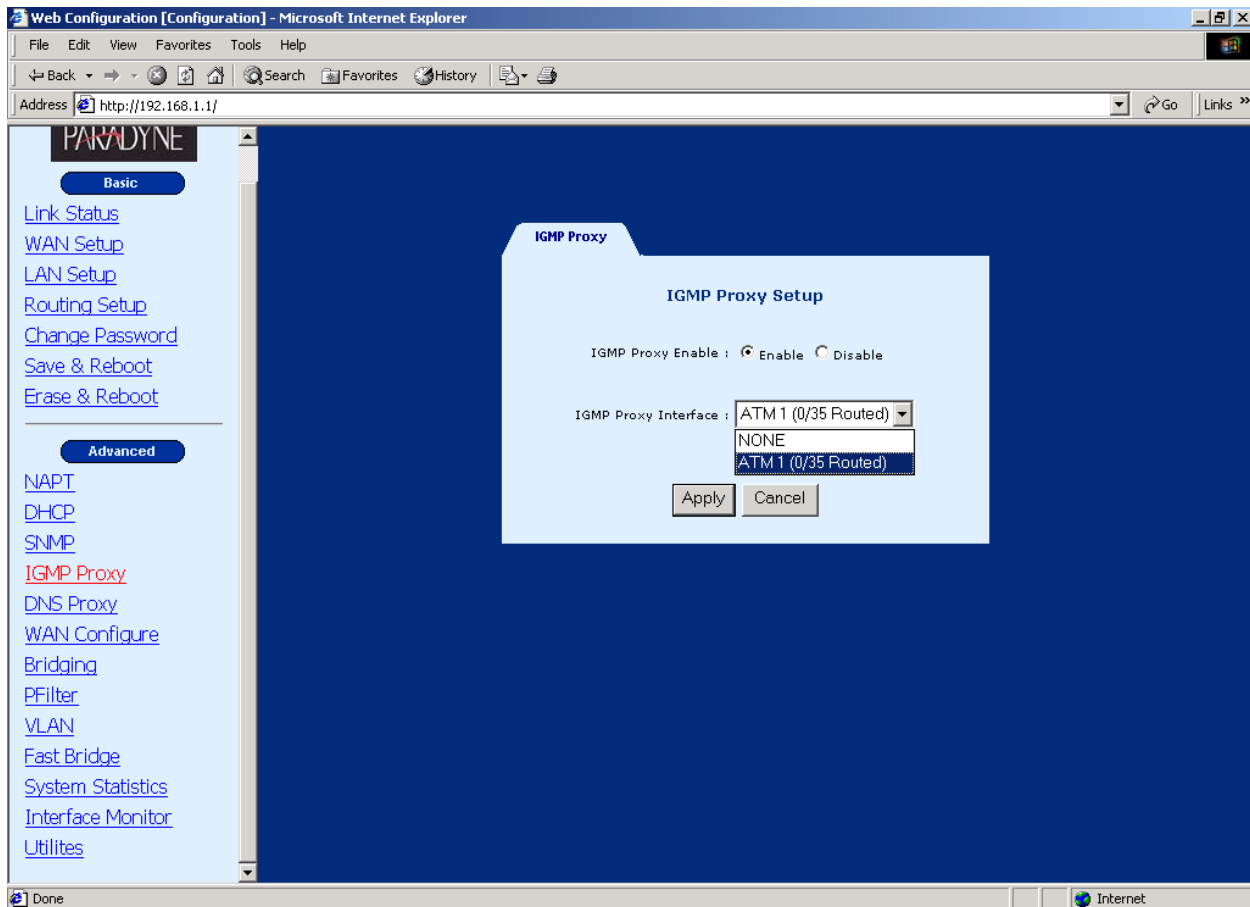
Keepalive Interval(sec):

**Current ATM PVC List**

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	Keepalive Interval	PPPoE Mode	Status
<input type="radio"/>	Bridged	0	35	LLC	OFF	-	-	-	-	0	0	-	Down
<input checked="" type="radio"/>	Routed	0	34	LLC	ON	10.0.0.1	255.255.255.252	-	-	0	0	-	Down

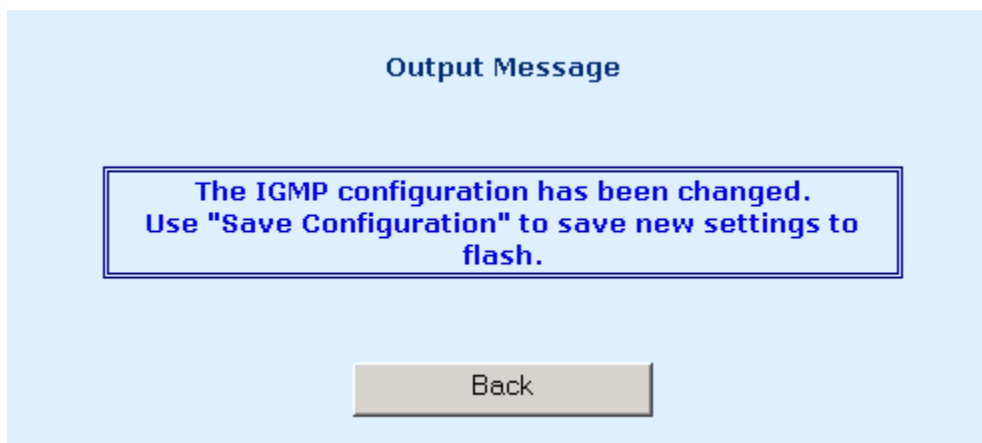
Done Internet

**STEP 2:** Click **IGMP Proxy** on the Advanced menu bar.



**STEP 3:** Click **Enable** and choose the interface ATM1-ATM16 that the router is used to connect to the server. This depends on VC to which interface it is assigned.

**STEP 4:** Click **Apply** to submit the settings.



## CHAPTER 12 VLAN

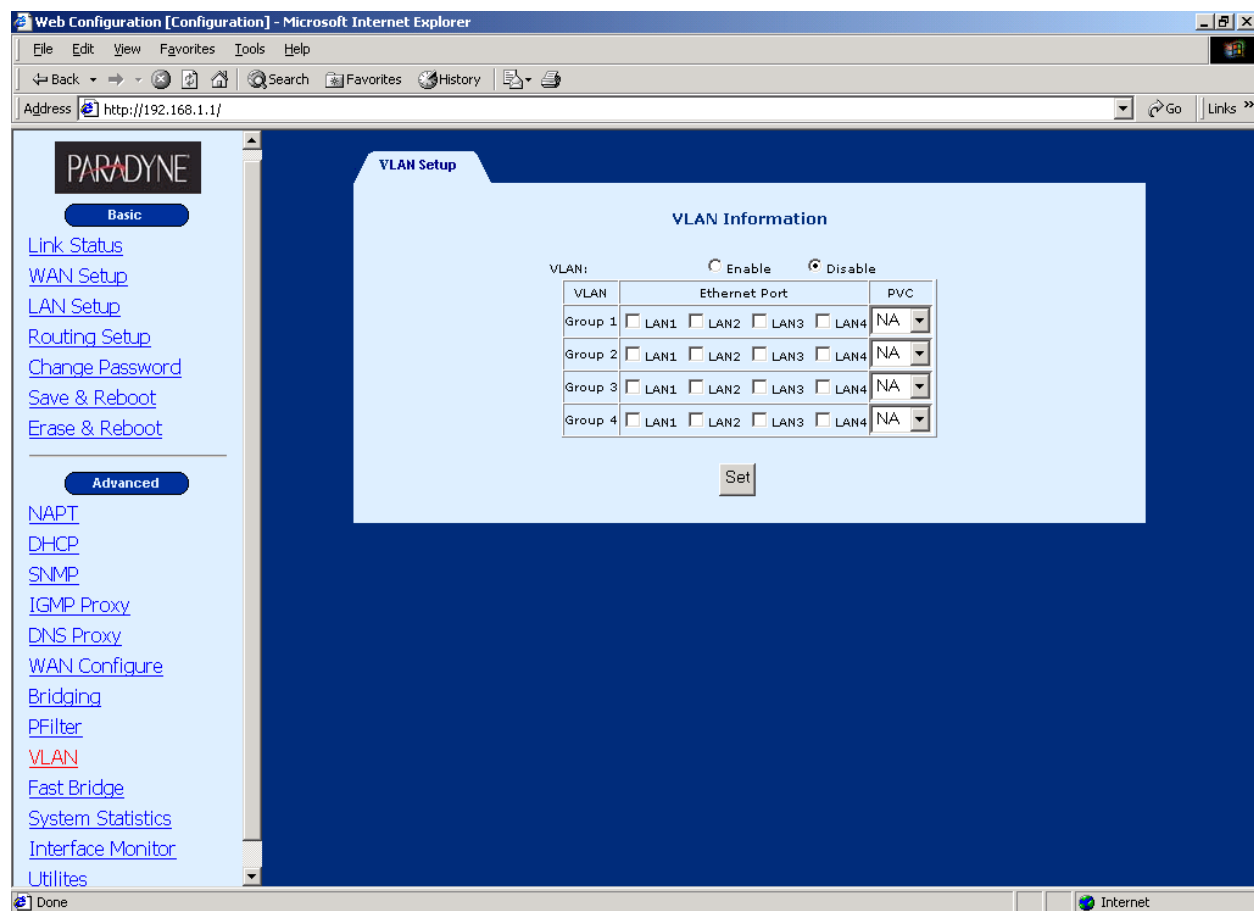
To configure the VLAN function, click on **VLAN** in the Advanced menu bar. VLAN is disabled by factory default. To enable it, select **Enable** and click on the **Set** button. Then you can proceed to create the VLAN groups. The router supports four VLAN groups, 1 to 4. You can choose and join different Ethernet ports to the PVC running in RFC 1483 bridged mode. Packets will be transmitted or received from these ports to the appointed PVC. The packets of the VLAN groups are not routable. Packets that do not belong to the VLAN group are routable.

### Parameters and buttons

The PVC field displays the values of the PVCs that have been set up (refer to the WAN Setup section). Click on the Set button to apply the settings, or click on the Clear button to delete a VLAN group.

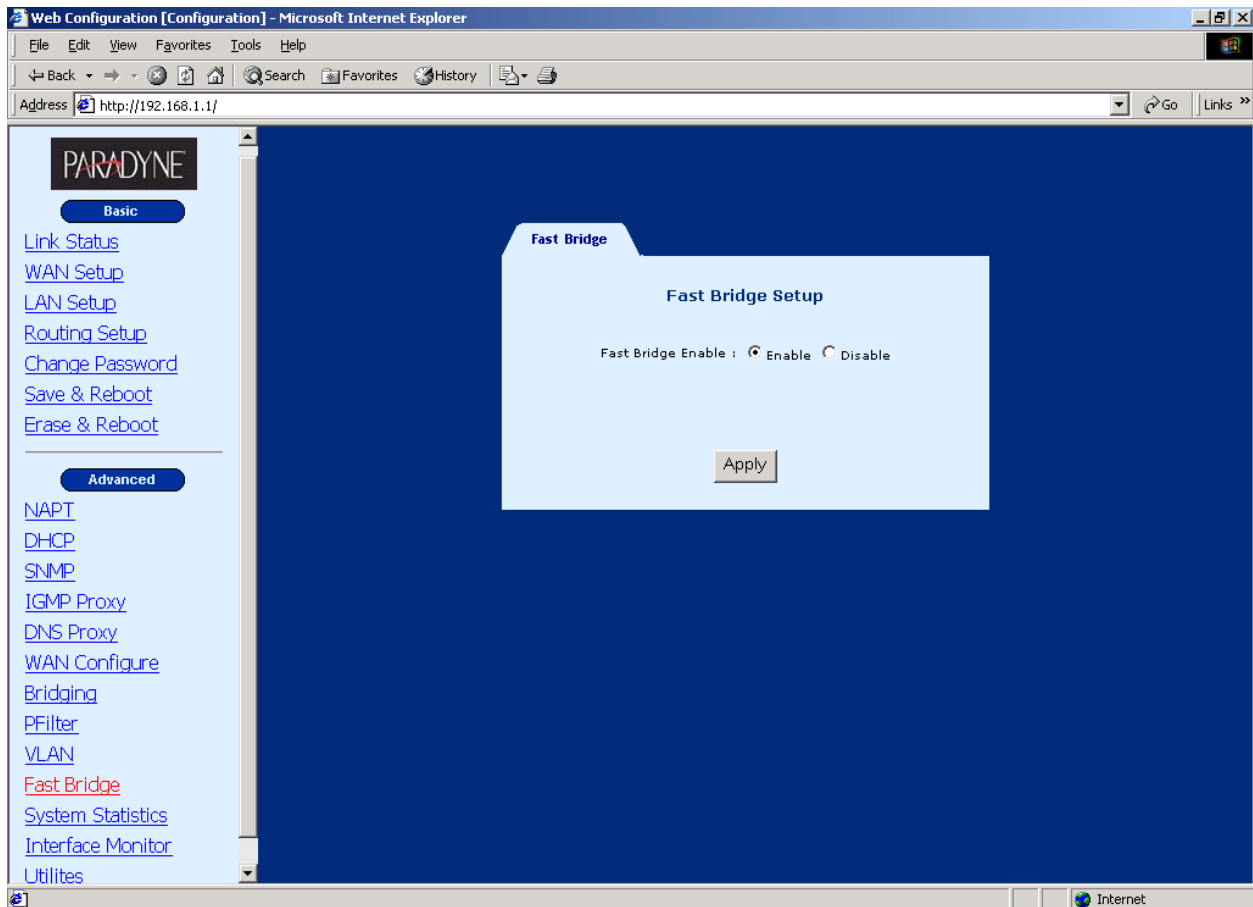
#### Notes:

1. You must save the parameters and reboot your router before the VLAN will be active.
2. Each LAN can be assigned to only one group.
3. Each PVC can be assigned to only one group.



## CHAPTER 13 Fast Bridge

To configure the fast bridge, click on **Fast Bridge** in the Advanced menu bar.

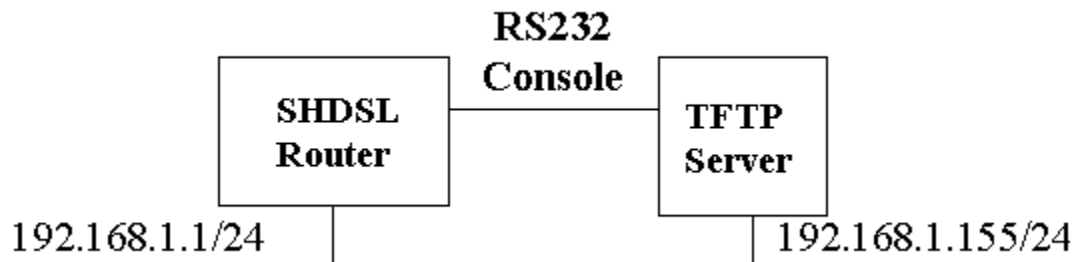


## CHAPTER 14 Maintenance and Diagnostics

This chapter describes how to perform a software upgrade, configuration backup, or configuration restoration, and how to use the diagnostic functions of the router.

### 14.1 Software Upgrade and Configuration Backup /Restoration

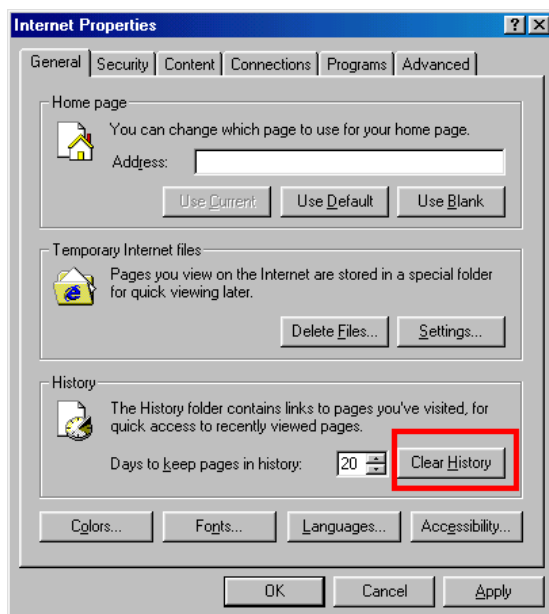
The router supports TFTP upgrade via the console, Telnet, and Web browser. Using a TFTP server, you can upgrade the software, back up the configuration, and retrieve past configurations. This section describes how to achieve these tasks using the console port or LAN port.



In the above diagram, the TFTP server is a PC with TFTP software installed. If you will use the console port to perform the TFTP upgrade, connect the console port of the router to your PC. If you will use Telnet or Web browser, connect the LAN port of the router to your Ethernet LAN.

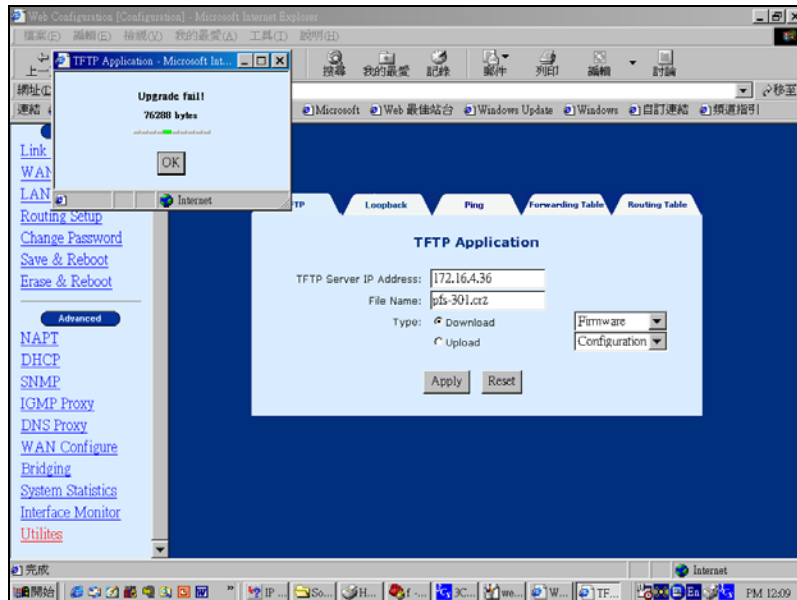
Notes:

After the home page is upgraded, right-click your Internet Explorer shortcut icon on your desktop and choose Properties on the popup menu. On the Internet Properties window, click on the **Clear History** button and click **OK**. Then you can use the Web browser to log on to the router.





If a wrong format of the file is uploaded, a failure message will display during the upgrade. The following is an example of upgrade failure resulting from an incorrect file format.



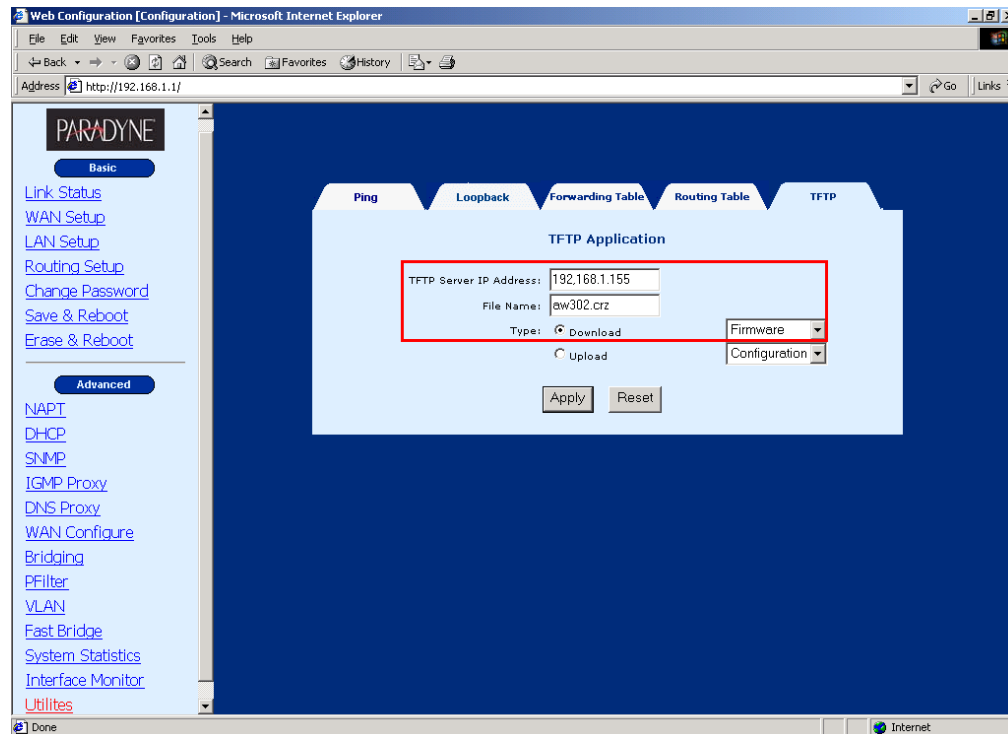
Before performing the TFTP upgrade, run the TFTP software. Click on **Utilities** on the Advanced menu bar. Fill out the TFTP Server IP address, file name, and upgrade type.

- Software upgrade: Check Download and choose Firmware in the column to the right.
- Homepage upgrade: Check Download and choose Homepage in the column to the right.
- Configuration backup: Check Upload and choose Configuration in the column to the right
- Retrieving Configurations: Check Download and choose Configuration in the column to the right

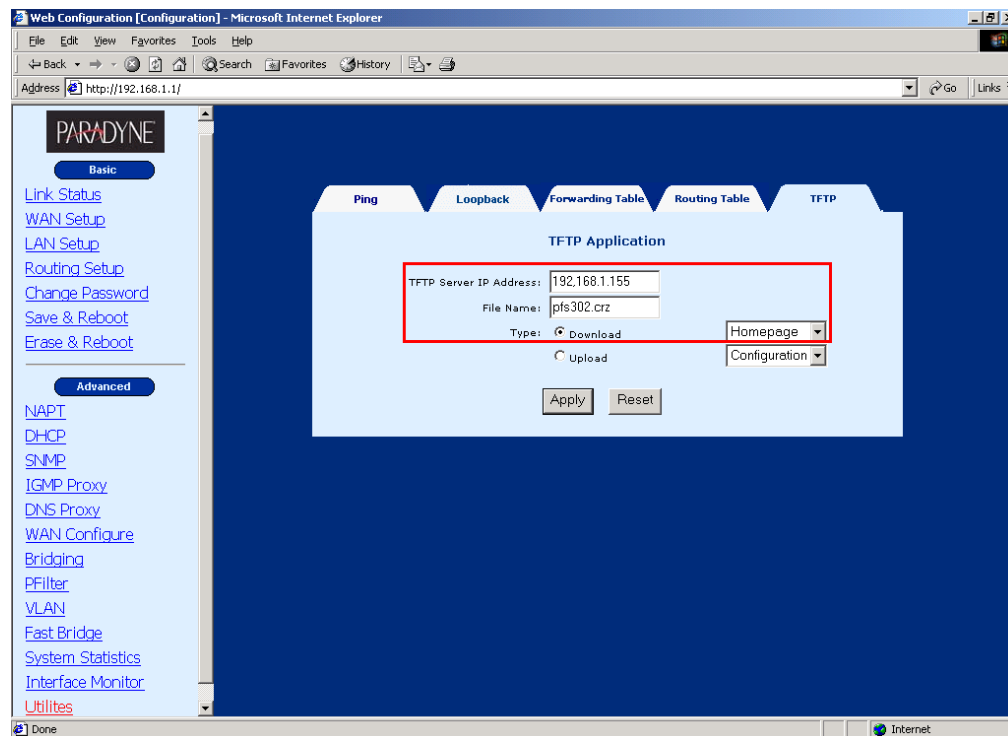
After completing the settings, click **Apply** to perform the function and note the following.

- After software or homepage upgrades are complete, reboot the device to run the new file.
- After the configurations are retrieved, also write the configurations to the Flash memory.

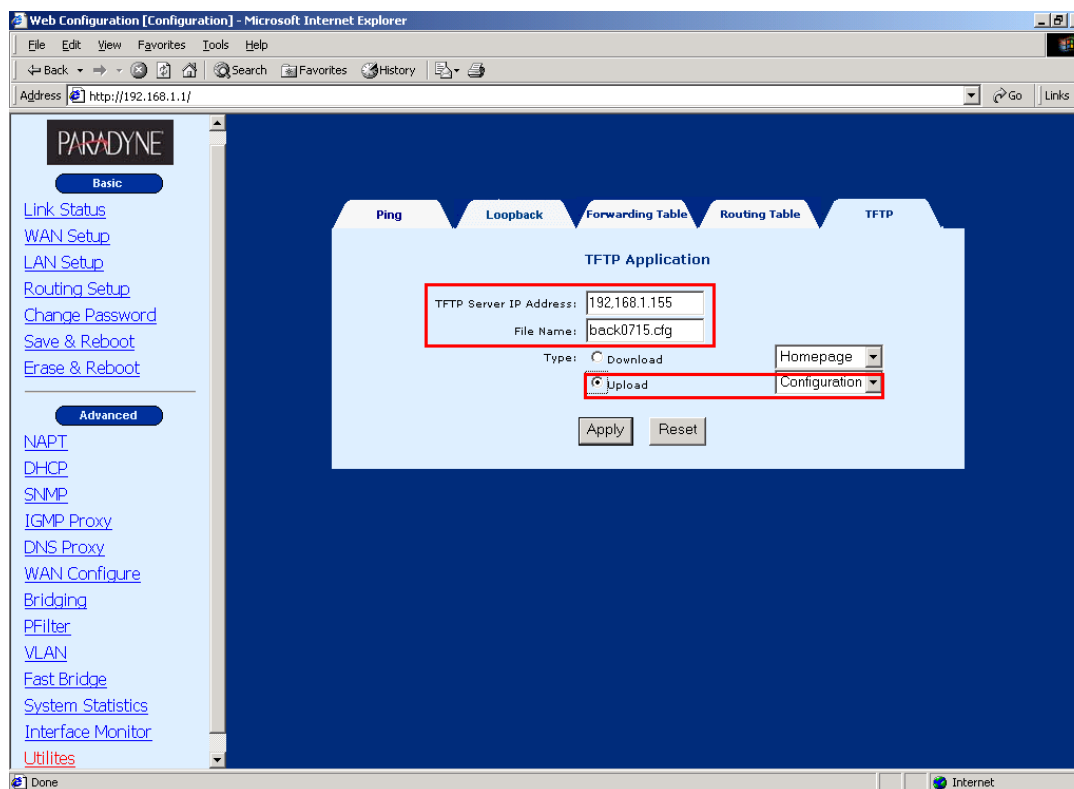
The following is an example of how to set up the parameters for software upgrade.



The following is an example of how to set up the parameters for homepage upgrade.

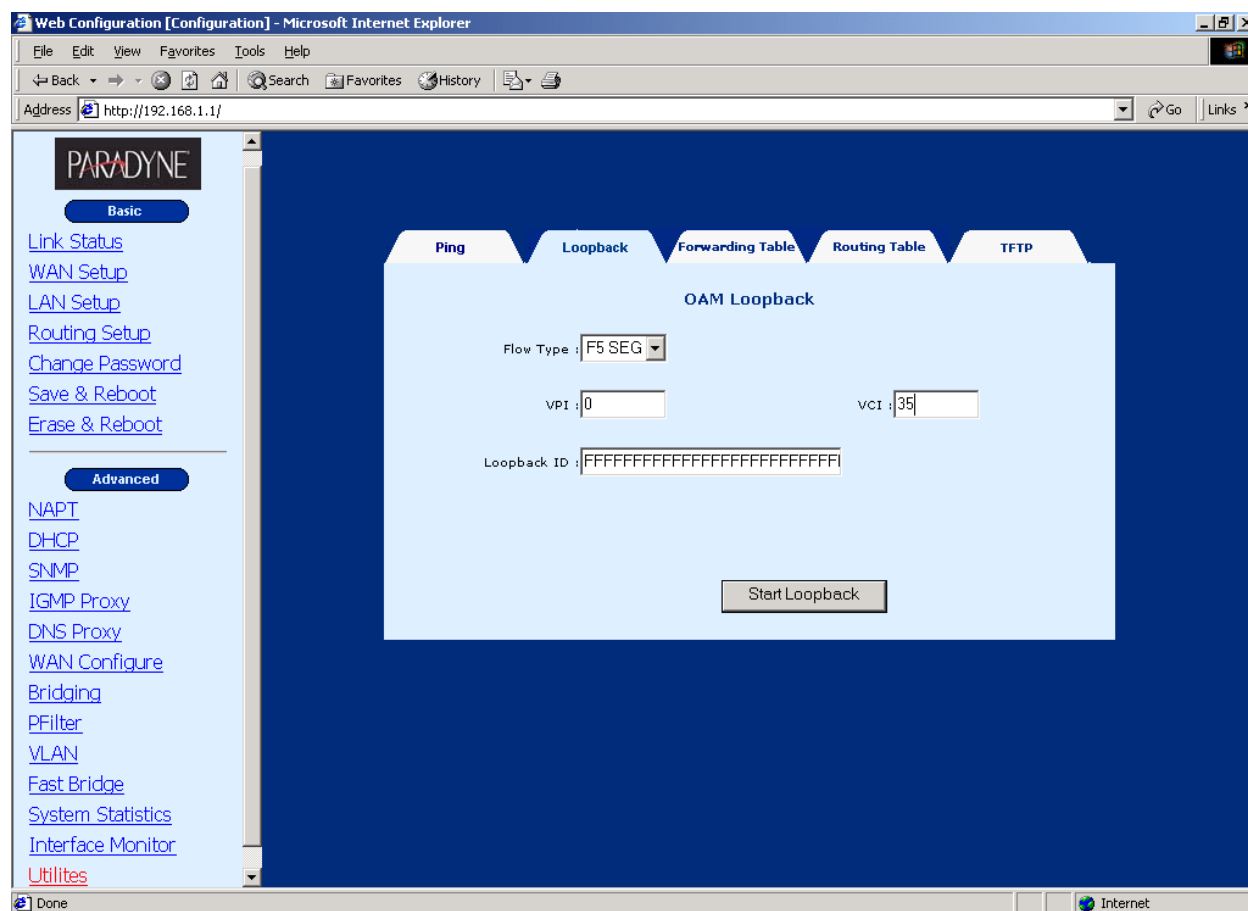


To upload the configurations, check **Upload**, select **Configuration**, and click on the **Apply** button to submit the settings.



## 14.2 OAM Loopback

Click on **Utilities** on the Advanced menu bar, and click on the **Loopback** tab on the main screen.



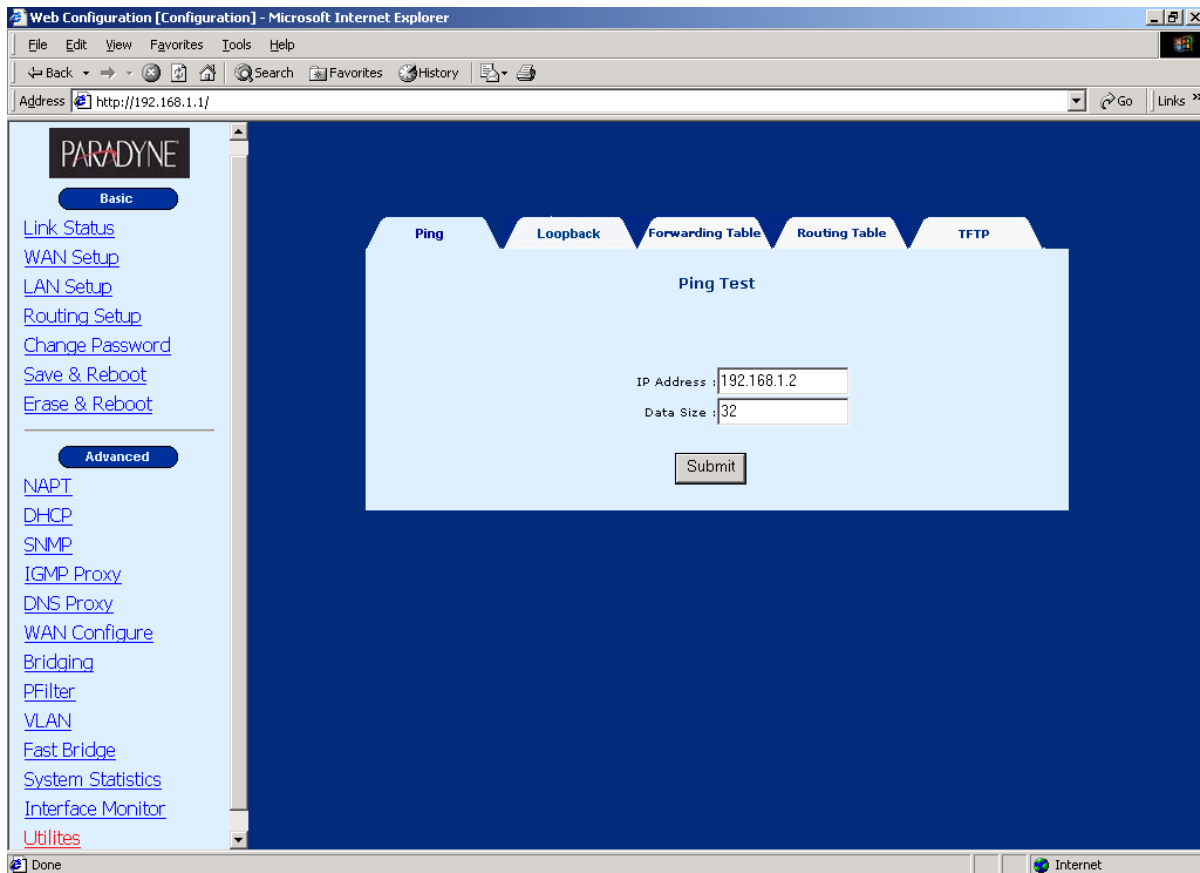
After filling out the following parameters, click **Start Loopback** to perform the loopback.

Flow Type	Choose the F5 loopback type. Seg is the segment loopback. It verifies the connection between the router and DSLAM. Ete is the end-to-end loopback, verifying the connection between the router and the ISP Broadband RAS.
VPI	Specify the VPI that will perform the loopback.
VCI	Specify the VCI that will perform the loopback.
Loopback ID	Specify the ID number on the ATM network that will loop back the signals.

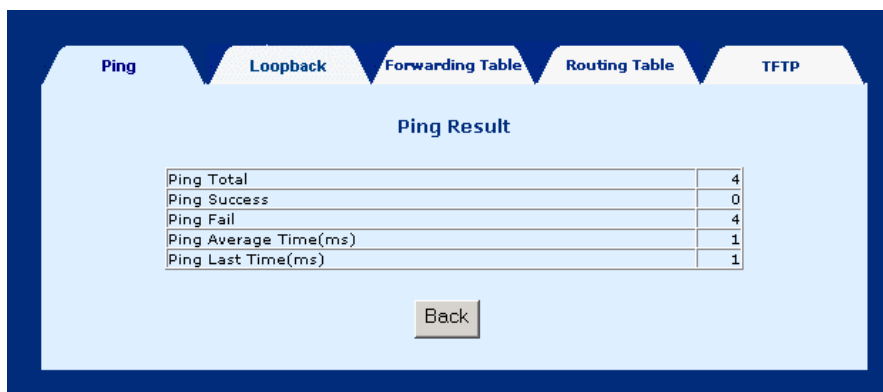
### 14.3 Ping

A Ping test is used to verify the status of a network connection after the RIP or static route function is enabled. Ping sends a request message to the host and waits for a return message. This diagnostic function can verify if the remote host is reachable. Ping can also measure the round-trip time to the remote host.

Click **Utilities** on the Advanced menu bar, and click on the **Ping** tab on the main screen. After typing the IP address and the ping data size, click **Submit** to perform the test. The ping result will display later.

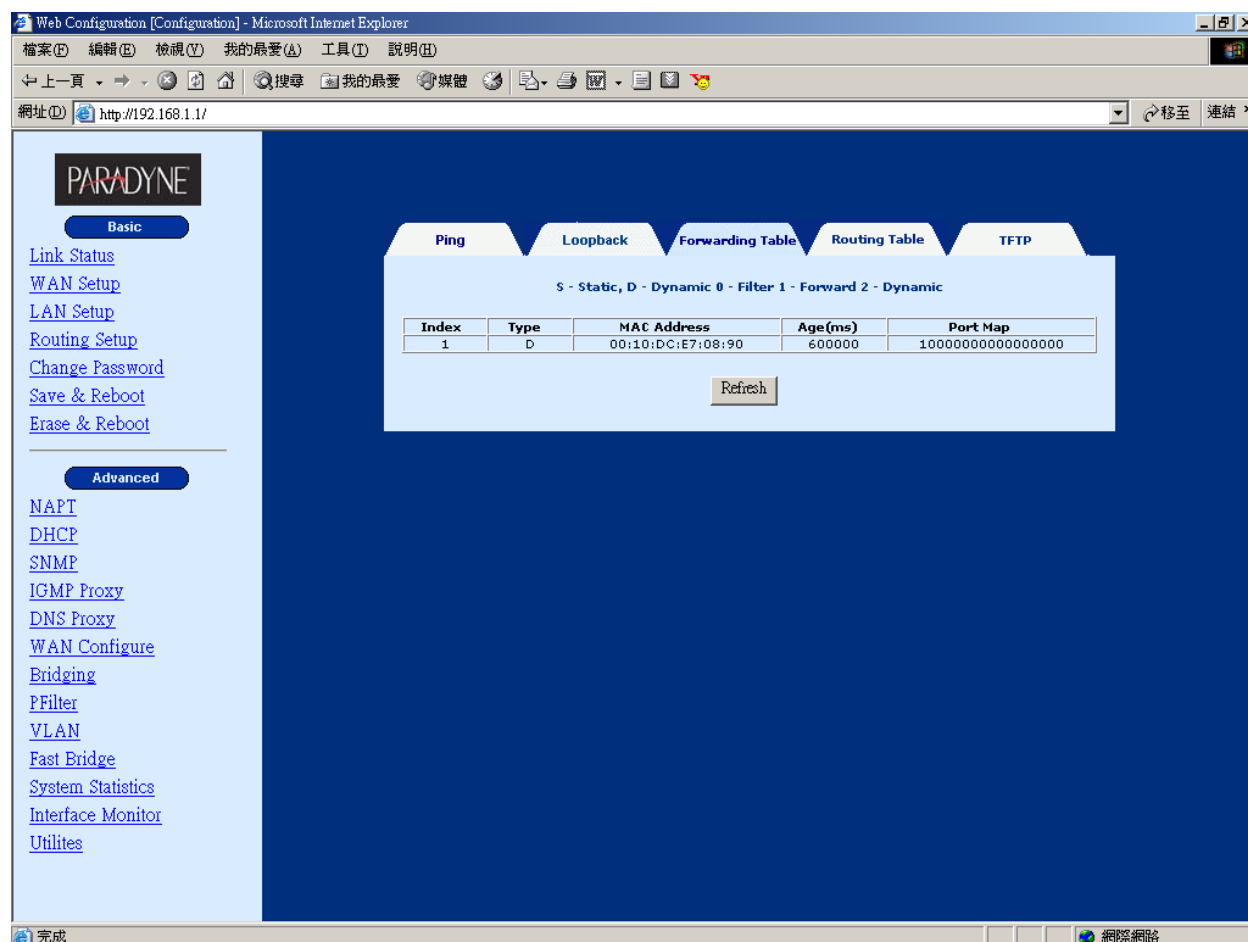


The following is an example of the ping result.



## 14.4 Forwarding Table

Click **Utilities** on the Advanced menu bar, and click on the **Forwarding Table** tab on the main screen to view the forwarding table.



## 14.5 Routing Table

Click **Utilities** on the Advanced menu bar, and click on the **Routing Table** tab on the main screen to view the routing table.

## 14.6 Performance Monitoring

- System statistics


Click **System Statistics** on the Advanced menu bar to monitor the interface status and collect the statistics of the TCP/IP.

Web Configuration [Configuration] - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address http://192.168.1.1/ Go Links >>



**Basic**

[Link Status](#)

[WAN Setup](#)

[LAN Setup](#)

[Routing Setup](#)

[Change Password](#)

[Save & Reboot](#)

[Erase & Reboot](#)

**Advanced**

[NAPT](#)

[DHCP](#)

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[DNS Proxy](#)

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[PFilter](#)

[VLAN](#)

[Fast Bridge](#)

[System Statistics](#)

[Interface Monitor](#)

[Utilities](#)

**Interface** TCP-IP

**Interface Statistics**

IF	Admin Status	InOctets	InUcastPkts	InNUcastPkts	InDiscards	InErrors	OutOctets	OutUcastPkts	OutNUcastPkts	OutDiscards	OutErrors
LAN	Up	124945	884	42	0	0	426517	976	0	0	0
ATM1	Up	0	0	0	0	0	3888	0	0	0	0
ATM2	Down	0	0	0	0	0	0	0	0	0	0
ATM3	Down	0	0	0	0	0	0	0	0	0	0
ATM4	Down	0	0	0	0	0	0	0	0	0	0
ATM5	Down	0	0	0	0	0	0	0	0	0	0
ATM6	Down	0	0	0	0	0	0	0	0	0	0
ATM7	Down	0	0	0	0	0	0	0	0	0	0
ATM8	Down	0	0	0	0	0	0	0	0	0	0
ATM9	Down	0	0	0	0	0	0	0	0	0	0
ATM10	Down	0	0	0	0	0	0	0	0	0	0
ATM11	Down	0	0	0	0	0	0	0	0	0	0
ATM12	Down	0	0	0	0	0	0	0	0	0	0
ATM13	Down	0	0	0	0	0	0	0	0	0	0
ATM14	Down	0	0	0	0	0	0	0	0	0	0
ATM15	Down	0	0	0	0	0	0	0	0	0	0
ATM16	Down	0	0	0	0	0	0	0	0	0	0

Internet

To display the interface statistics, click on the **Interface** tab, located at the top-left of the System Statistics screen. The Interface Statistics page displays statistics for all interfaces. The following information is displayed:

IF	The name of the interface
Admin Status	Indicates whether the interface is Up or Down
In Octets	The number of Octets (bytes) received
InUcastPkts	The number of unicast packets received
InBroadcastPkts	The number of broadcast packets received
InDiscards	The number of packets received that were discarded
InErrors	The number of inward errors
OutOctets	The number of Octets (bytes) transmitted
OutUcastPkts	The number of unicast packets transmitted
OutBroadcastPkts	The number of broadcast packets transmitted
OutDiscards	The number of packets transmitted that were discarded
OutErrors	The number of outward errors



To view TCP-IP statistics click on the **TCP-IP** tab at the top of the System Statistics page. The TCP-IP page displays the IP statistics, UDP statistics, TCP statistics, and ICMP statistics.

The screenshot shows a Microsoft Internet Explorer browser window displaying the Paradyne Web Configuration interface. The address bar shows <http://192.168.1.1/>. The interface has a left sidebar with navigation links under 'Basic' and 'Advanced' sections. The main content area is titled 'TCP/IP Statistics' and contains four tables: IP Statistics, Udp Statistics, Tcp Statistics, and Icmp Statistics.

**Basic**

- [Link Status](#)
- [WAN Setup](#)
- [LAN Setup](#)
- [Routing Setup](#)
- [Change Password](#)
- [Save & Reboot](#)
- [Erase & Reboot](#)

**Advanced**

- [NAPT](#)
- [DHCP](#)
- [SNMP](#)
- [IGMP Proxy](#)
- [DNS Proxy](#)
- [WAN Configure](#)
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- [VLAN](#)
- [Fast Bridge](#)
- [System Statistics](#)
- [Interface Monitor](#)
- [Utilities](#)

**TCP/IP Statistics**

**IP Statistics**

In receives	227	In Errors	(none)	In Unknown Protos	(none)	Forwarded Datagrams	0
Out Requests	220	Out Discards	0	Out No Routes	3		

**Udp Statistics**

Data grams In	0	Datagrams Out	0	Errors In	0
---------------	---	---------------	---	-----------	---

**Tcp Statistics**

Active Opens	0	Passive Opens	36	Attempt Fails	0	Current Establishments	0
Segments In	214	Segments Out	207	Segments retransmitted	0	Errors In	0

**Icmp Statistics**

**IN**

Messages	0	Errors	0	Destination Unreaches	0	Time Exceeds	0
Source Quenches	0	Redirects	0	Echos	0	Echo Repls	0

**OUT**

Messages	13	Errors	0	Destination Unreaches	13	Time Exceeds	0
Source Quenches	0	Redirects	0	Echos	0	Echo Repls	0

- Interface Monitor

Click **Interface Monitor** on the Advanced menu bar to monitor the transmission status.

**Web Configuration [Configuration] - Microsoft Internet Explorer**

Address: <http://192.168.1.1/>

**PARADYNE**

**Basic**

- [Link Status](#)
- [WAN Setup](#)
- [LAN Setup](#)
- [Routing Setup](#)
- [Change Password](#)
- [Save & Reboot](#)
- [Erase & Reboot](#)

**Advanced**

- [NAPT](#)
- [DHCP](#)
- [SNMP](#)
- [IGMP Proxy](#)
- [DNS Proxy](#)
- [WAN Configure](#)
- [Bridging](#)
- [PFilter](#)
- [VLAN](#)
- [Fast Bridge](#)
- [System Statistics](#)
- [Interface Monitor](#)
- [Utilities](#)

**Monitor**

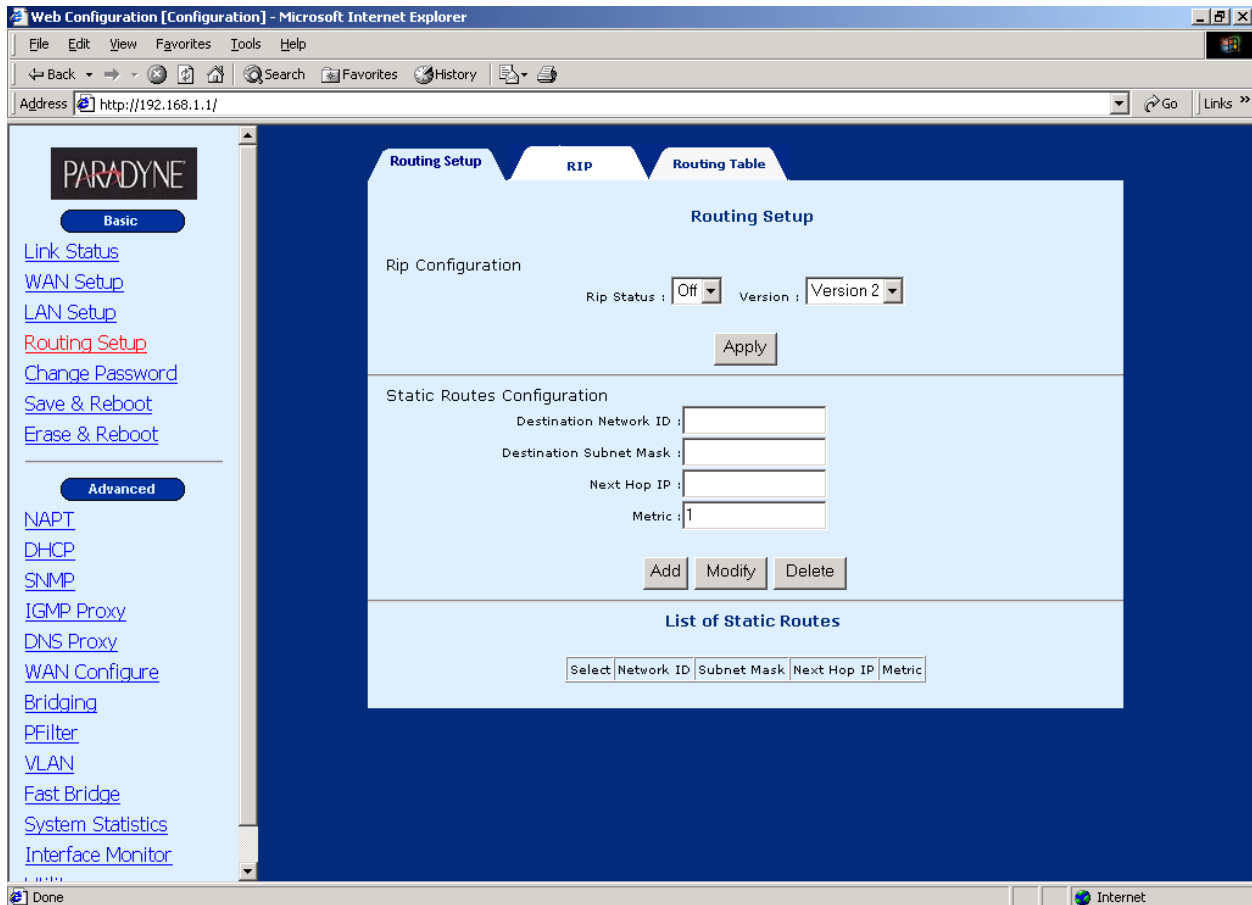
Interface	TxPkts	RxPkts	RxErrors	TxRate(bps)	RxRate(bps)	Status
0 - ETH	1164	1357	0	0	0	Up
1 - ATM	40	0	0	0	0	Down
2 - ATM	0	0	0	0	0	Disable
3 - ATM	0	0	0	0	0	Disable
4 - ATM	0	0	0	0	0	Disable
5 - ATM	0	0	0	0	0	Disable
6 - ATM	0	0	0	0	0	Disable
7 - ATM	0	0	0	0	0	Disable
8 - ATM	0	0	0	0	0	Disable
9 - ATM	0	0	0	0	0	Disable
10 - ATM	0	0	0	0	0	Disable
11 - ATM	0	0	0	0	0	Disable
12 - ATM	0	0	0	0	0	Disable
13 - ATM	0	0	0	0	0	Disable
14 - ATM	0	0	0	0	0	Disable
15 - ATM	0	0	0	0	0	Disable
16 - ATM	0	0	0	0	0	Disable

Reset

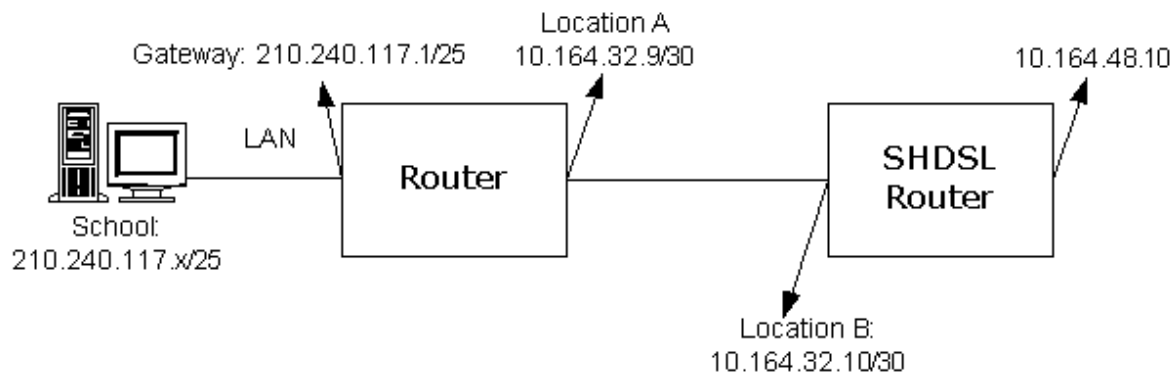
## CHAPTER 15 Application Example

### 15.1 Adding the Static Route (Web)

Click **Routing Setup** on the Advanced menu bar.



The following demonstrates a school application as an example.

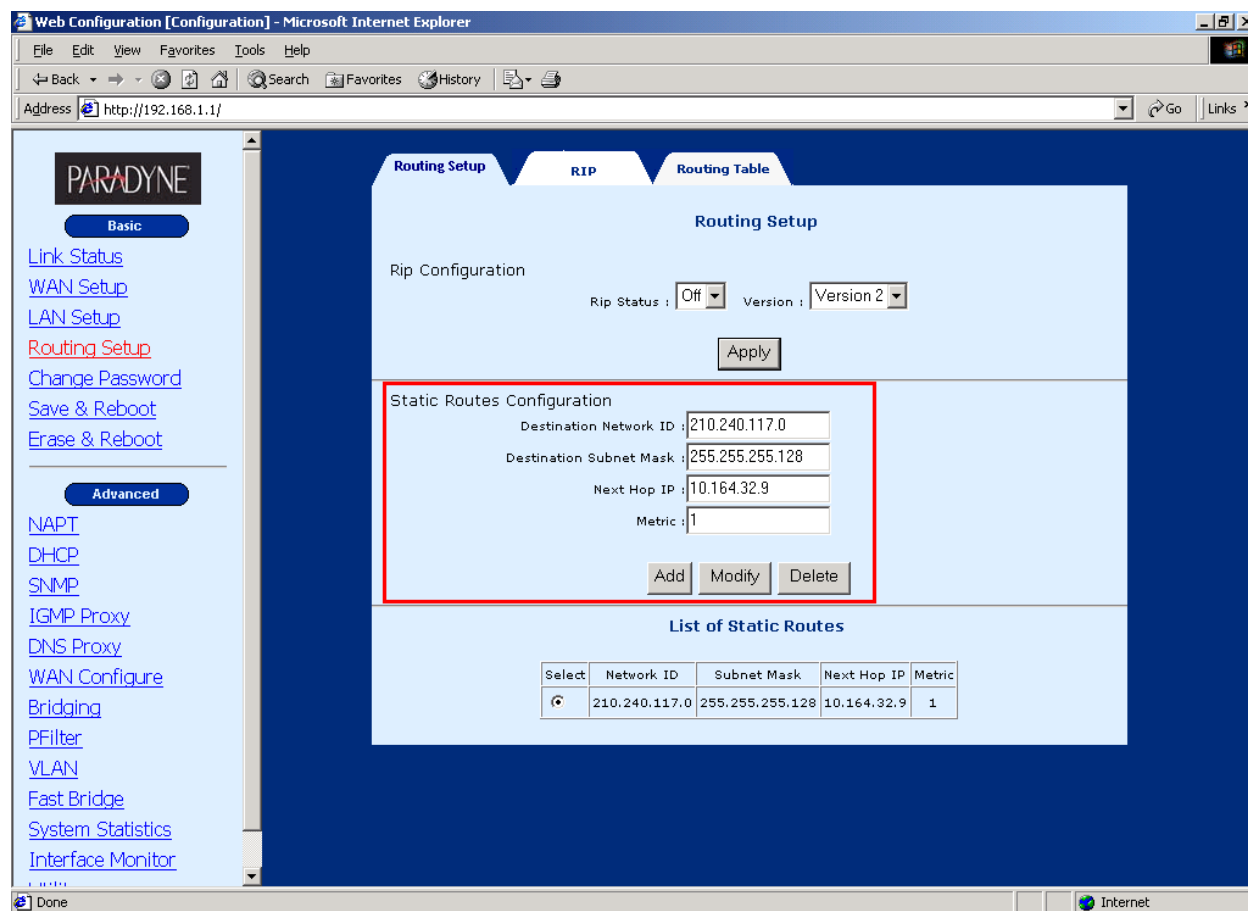


- Location A: 10.164.32.9; Netmask: 255.255.255.252
- Location B: 10.164.32.10; Netmask: 255.255.255.252
- Network of the School: 210.240.117.0; Netmask: 255.255.255.128

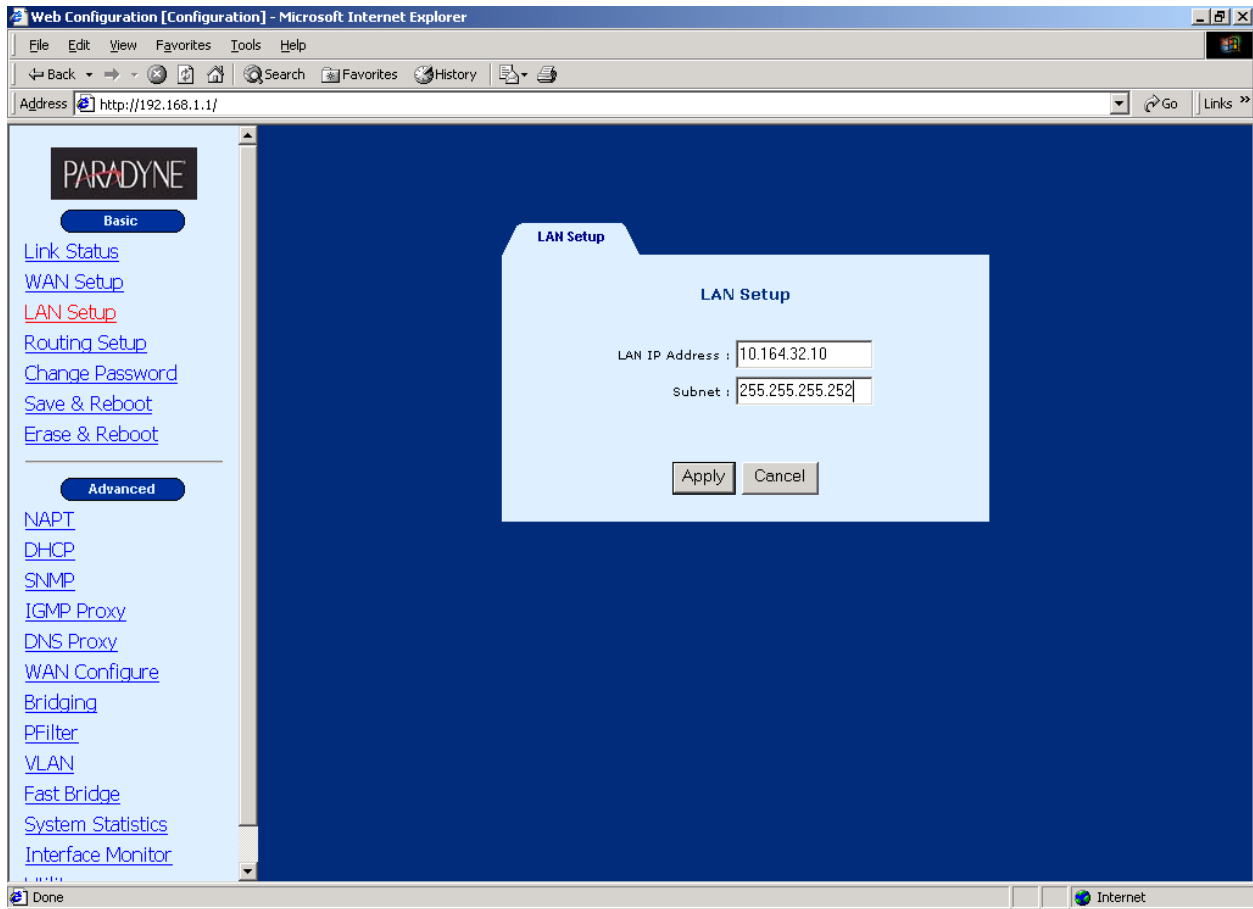
In the above example, you would add the following static route to the router.

210.240.117.0; Netmask: 255.255.255.128; Next hop: 10.164.32.9

Enter the parameters of the static route and click on the **Add** button.



Click **LAN Setup** on the Basic men bar. After typing LAN IP 10.164.32.10 and Subnet 255.255.255.252, click on **Apply** to submit the settings.



## CHAPTER 16 Pin Assignments

### Console Port (RS232 DB9)

Pin number	Definition	Pin number	Definition
1	NC	6	NC
2	TD	7	NC
3	RD	8	NC
4	NC	9	NC
5	GND		

### LAN Port (RJ45)

Pin number	Definition	Pin number	Definition
1	RD+	5	NC
2	RD-	6	TD-
3	TD+	7	NC
4	NC	8	NC

### LINE Port (RJ45)

Pin number	Definition	Pin number	Definition
1	Loop2-1	5	Loop1-2
2	Loop2-2	6	Short with 2
3	Short with 1	7	NC
4	Loop1-1	8	NC

## CHAPTER 17 Console Access

To access the device via the console port the following are required:

- **VT100 Compatible Terminal**

This terminal is essential to perform the initial configuration of the router. This is normally a terminal with a VT100 emulation program, such as Telix or HyperTerminal Edition 5.

- **Console Port Cable**

An RS-232, DB9-to-DB9 straight-through cable is only required if you need to connect the device to a VT100 terminal or equivalent. The cable is not supplied with the SHDSL router.

### 17.1 Login

For access by console, the console PC should be installed with a standard VT100 emulation program, such as HyperTerminal 5 or Telix. You must connect the router to a PC using a serial cable. The following steps describe how to establish the console session.

**STEP1:** Run a standard VT100 program such as HyperTerminal (Ver. 5 is recommended), or Telix in the local terminal and select an open com port.

**STEP2:** Enter the following port settings:

- Baud rate: 9600
- Data bits: 8
- Parity: none
- Stop bit: 1
- Flow control: none

**STEP3:** After the session parameters are set up, press the Enter Key. You will be requested to enter the user name and password.

**STEP4:** After successfully logging in, the main menu will appear.

```

SHDSL Router                               Main Menu                               U
-----
>>0.[BASIC] - Basic Configuration
2.[ADVANCE] - Advance Configuration
3.[MON]     - Status/Statistics Monitor
4.[UTIL]    - Utilities
5.[SYS]     - System Information
6.[WRITE]   - Write Configuration
7.[REBOOT]  - Reboot
8.[QUIT]    - Disconnect

-----
[Up(^W)] [Down(^Z)] [Left(^A) - Prev Menu] [Right(^D) - Next Menu]
PATH> MAIN

```

## 17.2 Keyboard Operations

In this table, the caret (^) denotes the Ctrl key.

↑	The upward arrow key moves the cursor upward in the menu
↓	The downward arrow key moves the cursor downward in the menu.
←	Returns to the previous menu. If you are in a leaf menu you may need to push ^S first (to save the information)
→	Skips to the next menu.
^S	Hold down the Ctrl-S keys simultaneously to perform different actions such as Save, Add, Delete and Go.
^X	In the leaf menu, hold down the Ctrl-X keys simultaneously to return to the previous menu.
^L	Hold down the Ctrl-L keys simultaneously to return to the Home Menu.
^T	Hold down the Ctrl-T keys simultaneously to reset the value or statistics counted.
^R	Hold down the Ctrl-R keys simultaneously to refresh or restore the menu.
Q	Press the Q key to stop certain actions, such as software downloading.
Tab	In the leaf menu, some configuration fields are marked TAB. It means you need to press the TAB key to scroll through and select the pre-defined options.

The following backup keys can be used if your software doesn't support arrow keys:

^W	Moves the cursor upward [equal to the up arrow key]
^Z	Moves the cursor downward [equal to the down arrow key]
^A	Return to the previous screen [equal to the left arrow key]
^D	Enter the selected item [equal to the right arrow key]



The backup keys displayed at the bottom of the screen.

```

SHDSL Router      Basic Configuration
-----
>>1.[SYSTEM]    - System and Password Parameters
2.[SHDSL]       - SHDSL Link Status
3.[WAN]         - WAN Setup
4.[LAN]         - LAN Setup
5.[ROUTING]     - Static Route and RIP Parameters
6.[SAVE]        - Save and Reboot
7.[DEFAULT]     - Erase to Default

[Up(^W)] [Down(^Z)] [Left(^A) - Prev Menu] [Right(^D) - Next Menu]
PATH> MAIN/BASIC

```

In addition to the arrow keys to move the cursor in the menu, you can enter the requested screen by entering the number. For example, to enter MAIN/ADVANCE/DHCP/RELAY, follow the steps below:

**STEP 1:** Press the **2** key, to enter the **Advance** menu, and then press the **Enter** key.

```

SHDSL Router      Main Menu
-----
1.[BASIC]       - Basic Configuration
[ 2 ]>2.[ADVANCE] - Advance Configuration
3.[MON]         - Status/Statistics Monitor
4.[UTIL]        - Utilities
5.[SYS]         - System Information
6.[WRITE]       - Write Configuration
7.[REBOOT]      - Reboot
8.[QUIT]        - Disconnect

[Up(^W)] [Down(^Z)] [Left(^A) - Prev Menu] [Right(^D) - Next Menu]
PATH> MAIN

```

**STEP 2:** From the **MAIN/ADVANCE** menu, press the **2** key and then press the **Enter** key

```

SHDSL Router      Advance Configuration
-----
1.[NAT]         - NAT Parameters
[ 2 ]>2.[DHCP]   - DHCP Parameters
3.[SNMP]        - SNMP Parameters
4.[IGMP]        - IGMP Proxy Parameters
5.[DNS]         - DNS Proxy Parameters
6.[INTERFACE]   - Interface Parameters
7.[ROUTING]     - Routing Parameters
8.[BRIDGING]    - Transparent Bridging Parameters
9.[HTTPD]       - Web Server Parameters
10.[PF]         - Packet Filter Parameters
11.[SHDSL]      - SHDSL Characteristics Parameters
12.[ULAN]       - ULAN Parameters
13.[IF_BRIDGE]  - Fast Bridge Parameters

[Up(^W)] [Down(^Z)] [Left(^A) - Prev Menu] [Right(^D) - Next Menu]
PATH> MAIN/ADVANCE

```

**STEP 3:** Press the **2** key, and then press the **Enter** key in MAIN/ADVANCE/DHCP.

SHDSL Router	DHCP Parameters
-----	
1.[Server]	- DHCP Server Parameters
[ 2]>2.[Relay]	- BOOTP/DHCP Relay Parameters
3.[Fixed]	- Fixed Host IP Address List
4.[Client]	- Enable/Disable DHCP Client
-----	
[Up<^W>] [Down<^Z>] [Left<^A> - Prev Menu] [Right<^D> - Next Menu]	
PATH> MAIN/ADVANCE/DHCP	

**STEP 4:** Now you have reached MAIN/ADVANCE/DHCP/RELAY.

SHDSL Router	BOOTP/DHCP Relay Parameters
-----	
BOOTP/DHCP Relay(TAB)	: Disabled
Server IP	:
-----	
^S - Save      ^L - Home Menu      ^X - Prev Menu	
PATH> MAIN/ADVANCE/DHCP/RELAY	
MESSAGE>	

### 17.3 Motoring the SHDSL Line Status

Enter MAIN/BASIC/SHDSL to monitor the SHDSL Line status.

SHDSL Router	SHDSL Link Status
-----	
Termianl Type/Operate State	: CPE/Handshake
Actual Bit Rate(Kbps)	: 0
Line Attenuation(dB)	: 0
SNR Margin(dB)	: 18
CRC (since reset)	: 0
ES (since reset)	: 0
SES (since reset)	: 0
LOSWS (since reset)	: 15028
UAS (since reset)	: 15028
CRC (current 15 min)	: 0
ES (current 15 min)	: 0
SES (current 15 min)	: 0
LOSWS (current 15 min)	: 629
UAS (current 15 min)	: 629
CRC (current 1 day)	: 0
ES (current 1 day)	: 0
SES (current 1 day)	: 0
LOSWS (current 1 day)	: 15028
UAS (current 1 day)	: 15028
-----	
Any Key - Prev Page      ^T - Reset Counters      ^L - Home Menu	
PATH> MAIN/BASIC/SHDSL	

## 17.4 Password Setup

Enter MAIN/BASIC/SYSTEM to change the passwords.

SHDSL Router	System and Password Parameters
-----	
Terminal Type(TAB)	: CPE
Console Password Check(TAB)	: Enabled
Session Timeout(min)	: 0
New Administrator Password	: *****
Retype Password	: *****
New User Password	: ***
Retype Password	: ***
-----	
^S - Save      ^L - Home Menu      ^X - Prev Menu	
PATH> MAIN/BASIC/SYSTEM	
MESSAGE>	

- New Administrator Password and Retype Password: Enter the administrator password in the New Administrator Password and confirm the password by retyping the password in the Retype Password field.
- New User Password and Retype Password: Enter the user password in the New User Password and confirm the password by retyping the password in the Retype Password field.

## 17.5 Retrieve the Factory Default Settings

Enter BASIC/DEFAULT and press the Y key. After the default settings are set to the factory default, return to the main menu and enter MAIN>WRITE to save the configurations.

<pre> This will set system parameters to factory default !(Y/N) Set system parameters to factory default! Press any key to return to previous menu ..._ </pre>
--

## 17.6 Disable the Web Browser

The router allows access via a Web browser by factory default. To disable this function, enter ADVANCE/HTTPD, choose Disabled, and submit the setting.

SHDSL Router	Web Server Parameters
-----	
Web Server(TAB)	: Disabled
-----	
^S - Save      ^L - Home Menu      ^X - Prev Menu	
PATH> MAIN/ADVANCE/HTTPD	
MESSAGE>	

## 17.7 Save the Configurations

The new parameters can function immediately without being saved to the flash memory. However, to use these parameters after you restart the router, you must save them to the flash memory.

To write the configurations, enter MAIN/WRITE and press the Y key. After saving the configurations, you will be prompted if you need to reboot the device. Press the Y key to reboot the device or press the N key to keep operating the device.

```
This will write configuration to flash!(Y/N)
```

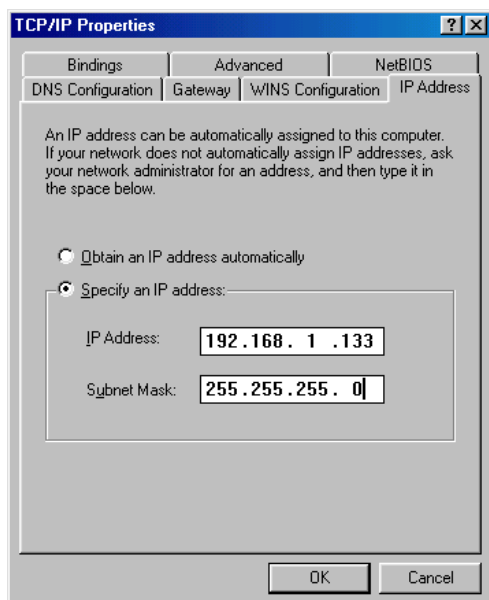
```
Write configuration to flash complete!
```

```
Reboot the system?(Y/N)
```

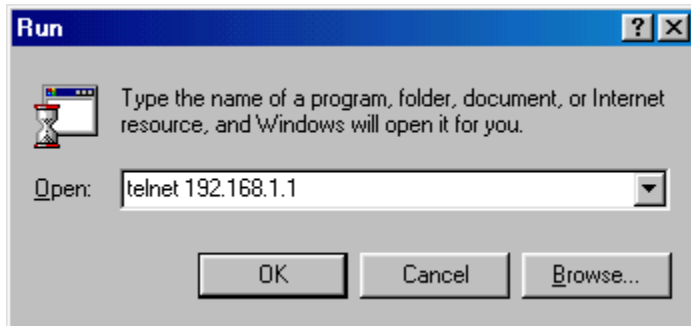
```
Wait, rebooting ...█
```

## 17.8 Login

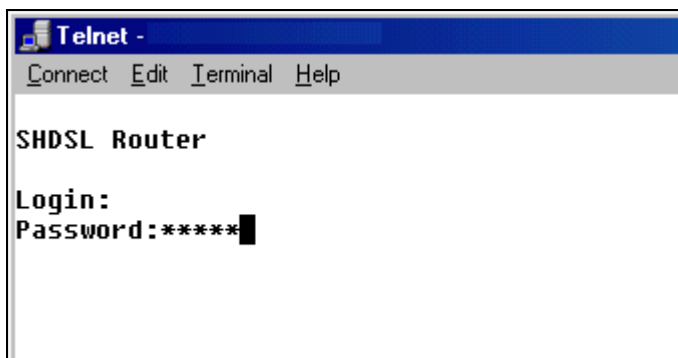
**STEP 1:** Configure your workstation to the same network segment as the router, such as IP address 192.168.1.133 and subnet mask 255.255.255.0.



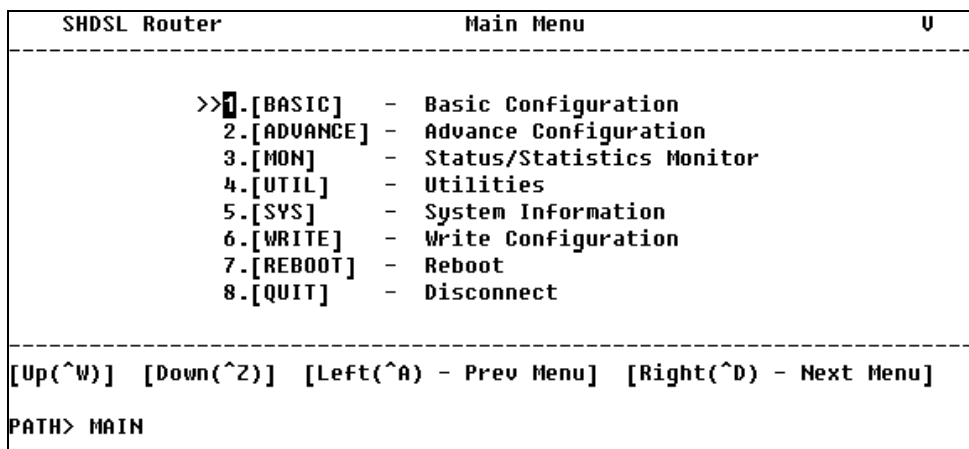
**STEP 2:** Click [Start]> [run], type **telnet 192.168.1.1** and click **OK**. (192.168.1.1 is the default IP address. If it was changed, use the new IP address to login.)



**STEP 3:** Enter the user name and password and press Enter to login (The default password and user name are root)



**STEP 4:** The following displays the main menu after login.



## Appendix A: Specifications

### WAN Interface (One SHDSL port)

SHDSL standard	ITU-T G991.2
SHDSL Line Interface	RJ45
Encoding scheme	TC-PAM
Line rate	Per ITU-T G991.2 (SHDSL)
Data rate	N x 64 Kbps, N=1~36, per Channel (2 channels)

### Encapsulation

Multi-protocol over AAL5 Bridged	RFC 2684 (1483)
Multi-protocol over AAL5 Route	RFC 2684 (1483)
PPP over Ethernet	RFC 2516
PPP over AAL5	RFC 2364

### ATM Attributes

VCs	16
AAL type	AAL5
ATM service class	UBR/CBR/VBR
ATM UNI support	UNI3.1/4.0
OAM	F4/F5

### Management

Console port	RS232/DB9
SNMP	Yes
TR-006 ADS Line MIB	Yes
Telnet	Yes
Web-based management	Yes
LED Indicators	Power, LAN status, ADSL status

### Local Interface (Four Ethernet ports)

Standard	IEEE 802.3 10/100 Base-T
Transparent bridge and learning	Yes

### Routing functions

IP static route	Yes
RIP and RIPv2	Yes
IGMP Proxy	Yes

**Network functions**

ARP	Yes
DNS, NAT/PAT, DHCP/BOOTP	Yes
PAP, CHAP	Yes
Automatic IP and DNS Assignment	RFC 1877

**Power Supply**

External power adapter	110 VAC or 230 VAC
Frequency	50/60 Hz

**Environmental Conditions**

Operating temperature	0–50 degrees Celsius
Relative humidity	5–95%(non-condensing)

Note: Specifications are subject to change without notice